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**Constantino et al.**

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(54) **MOBILE MULTIMEDIA WORKSTATION WITH NOVEL CLAMP**

312/223.3; 280/79.3, 47.34, 47.35;  
108/151, 50.01, 50.02, 180, 182, 186,  
108/189, 190; 248/229.14, 229.24, 228.5,  
248/230.5, 231.61, 918

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See application file for complete search history.

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<i>F16M 11/42</i>	(2006.01)
<i>A47B 21/02</i>	(2006.01)
<i>B64F 1/00</i>	(2006.01)
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<i>B64D 47/08</i>	(2006.01)

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CPC ..... *A47B 21/04* (2013.01); *A47B 21/02* (2013.01); *B64F 1/00* (2013.01); *F16M 11/42* (2013.01); *B64C 39/024* (2013.01); *B64D 47/08* (2013.01)

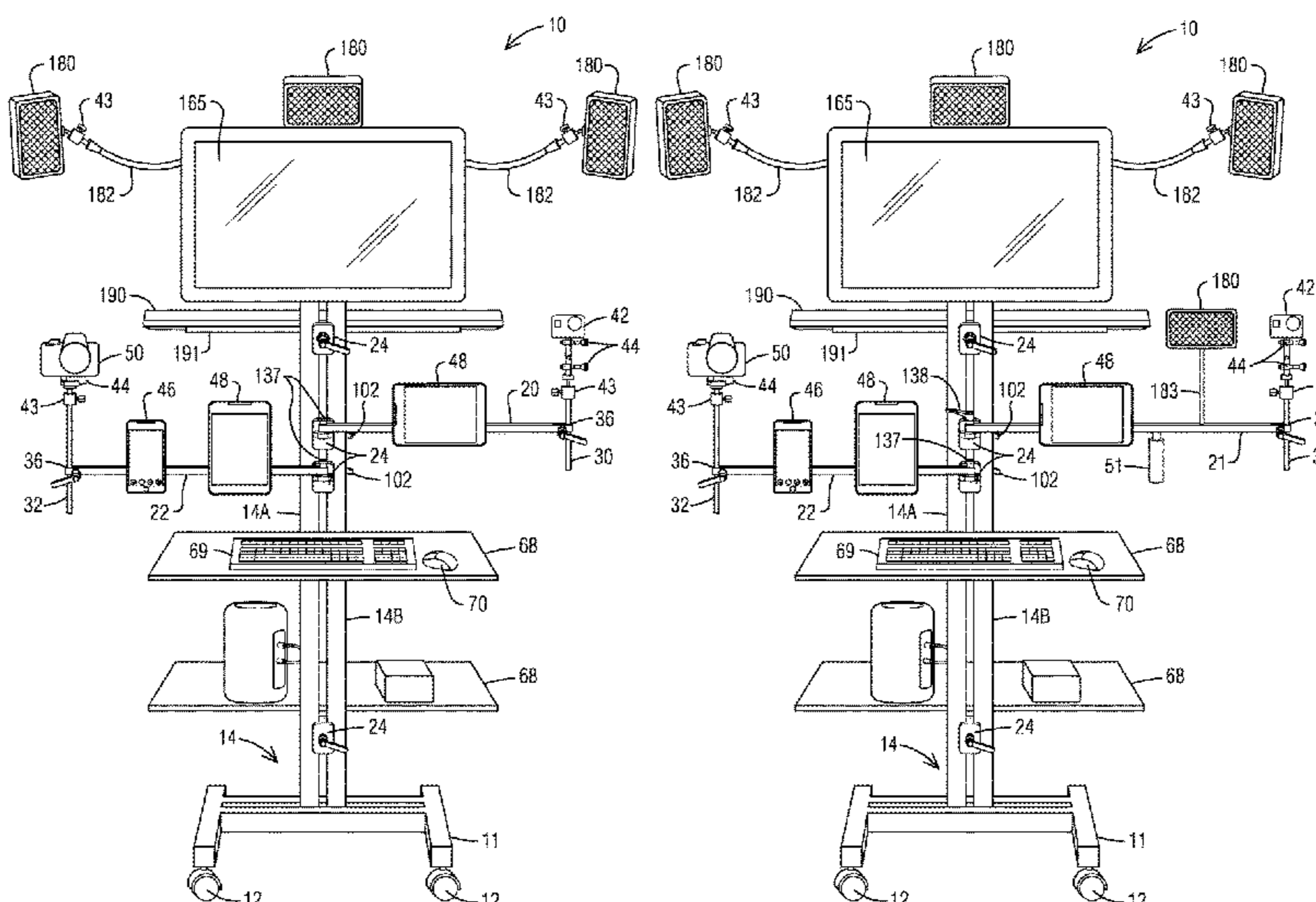
(57) **ABSTRACT**

(58) **Field of Classification Search**

CPC ..... Y10T 24/44598; Y10T 24/44974; A47F 5/04; A47F 5/05; A47F 5/06; A47F 5/106; A47B 46/005; A47G 25/0664; A47G 25/0685; D06F 57/04; D06F 57/08  
USPC ..... 269/17, 71; 211/196, 197, 205;

A mobile multimedia workstation comprises a base and a mobile component attached to the base bottom side. First and second upright members are attached to the top side and spaced apart to define an opening. A clamp having first and second clamp faces is connected by an adjustable member extending through the opening. The adjustable member is adjustable to urge the first and second clamp faces toward each other to apply a compressive force to first and second upright members and thereby hold a vertical position of the clamp. The clamp further comprises a first and a second protrusion each extending inwardly from the respective first and second clamp face and disposed within the opening between the first and second upright members.

**25 Claims, 18 Drawing Sheets**



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FIG. 1A

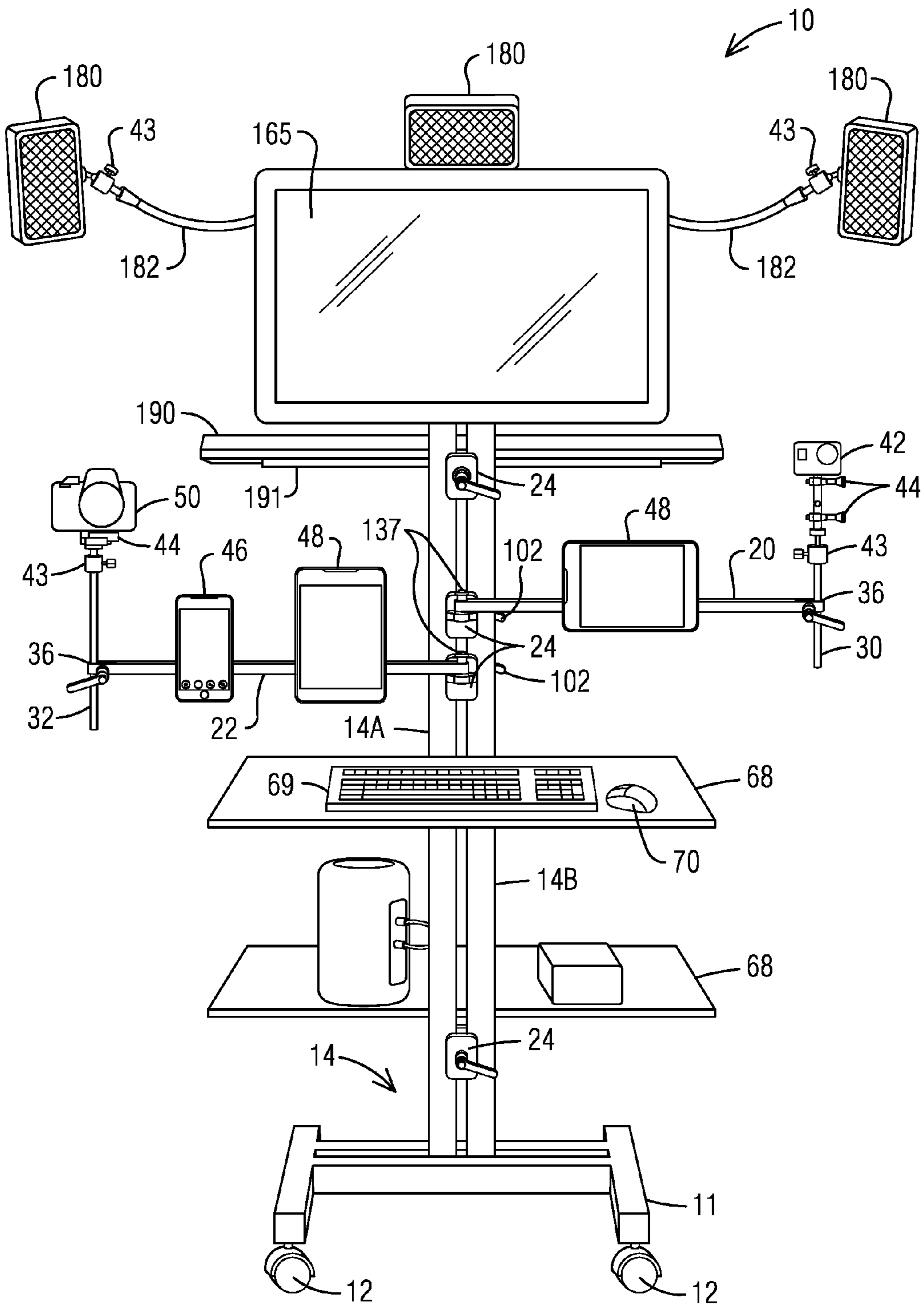
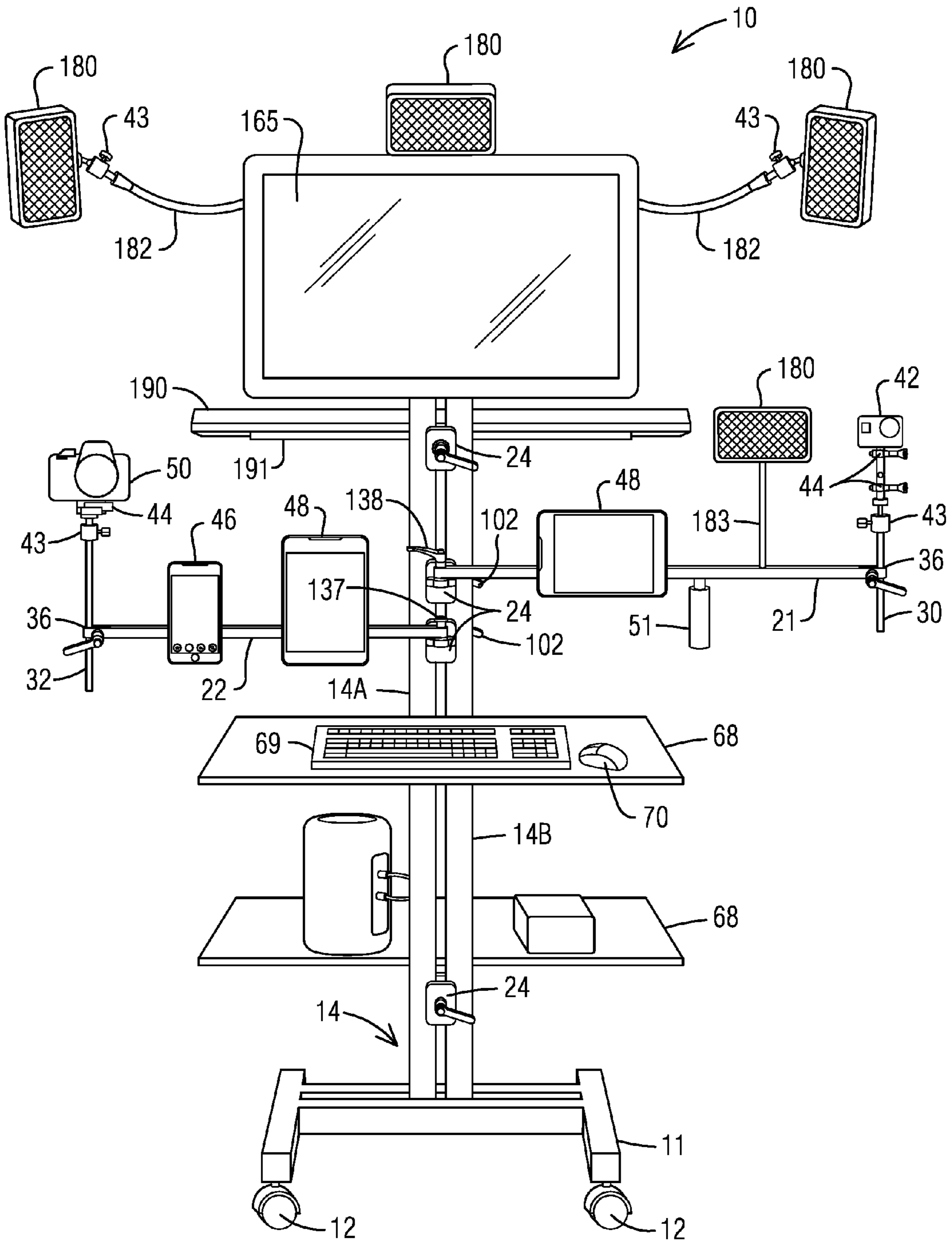


FIG. 1B



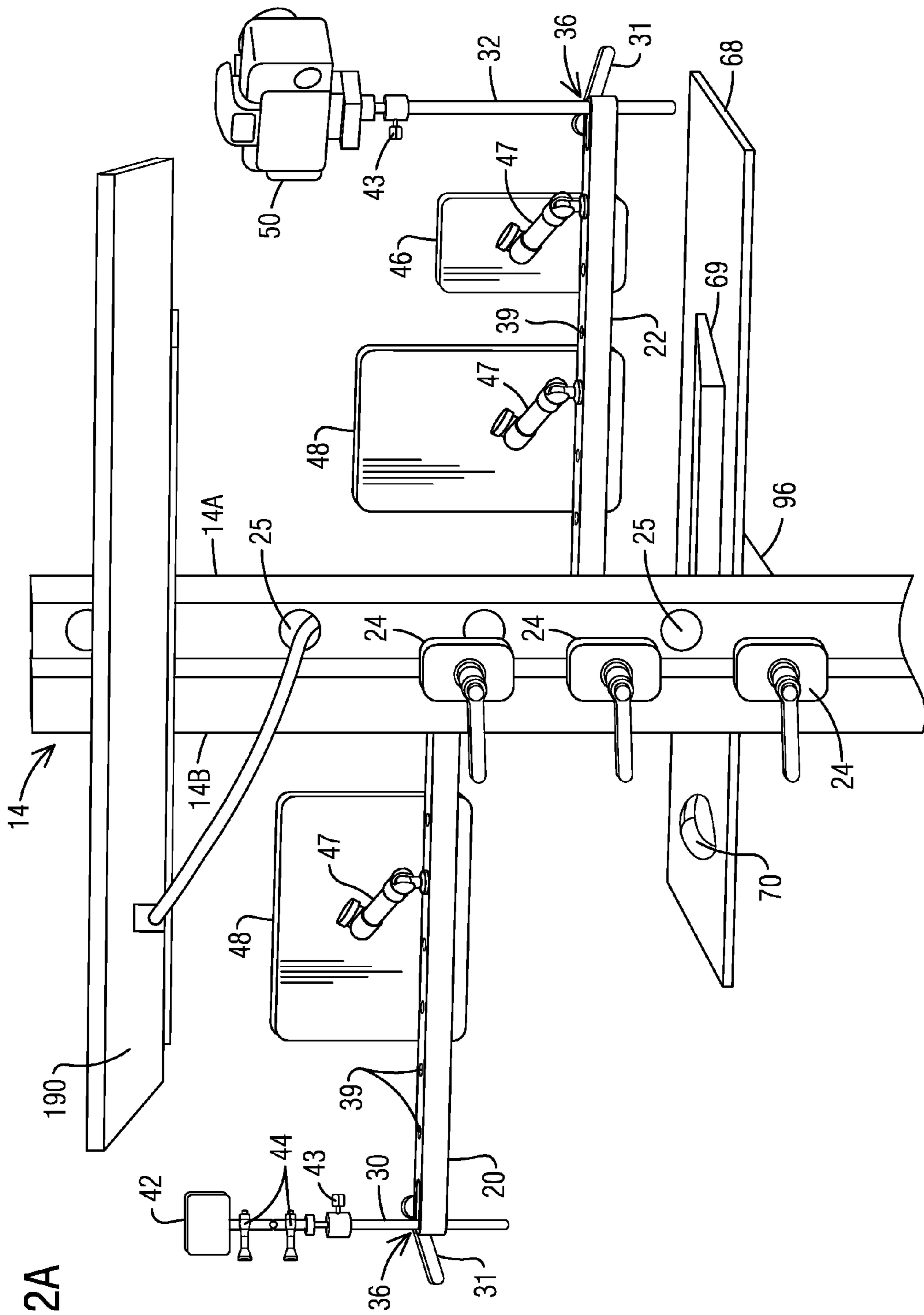
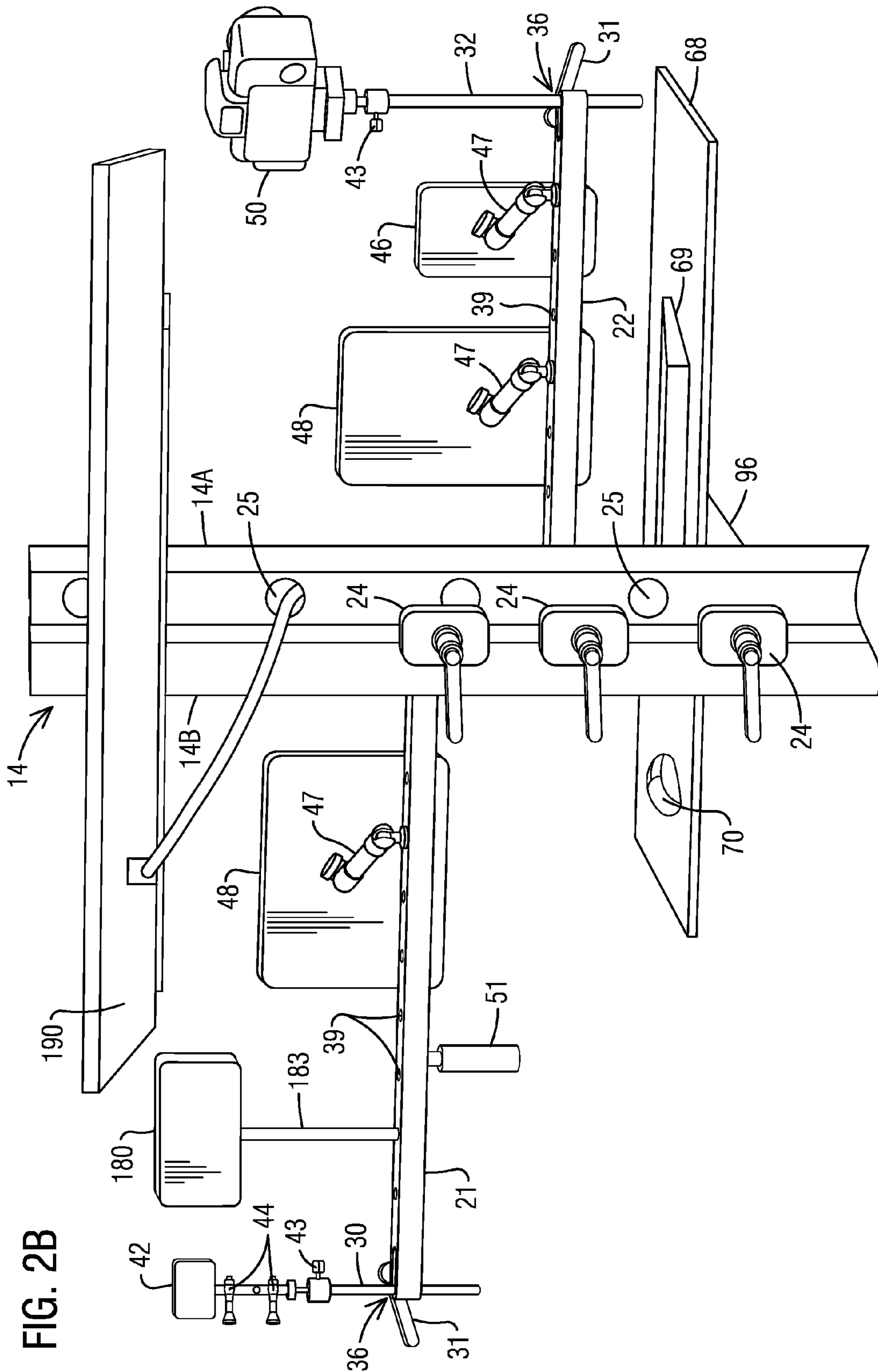


FIG. 2A



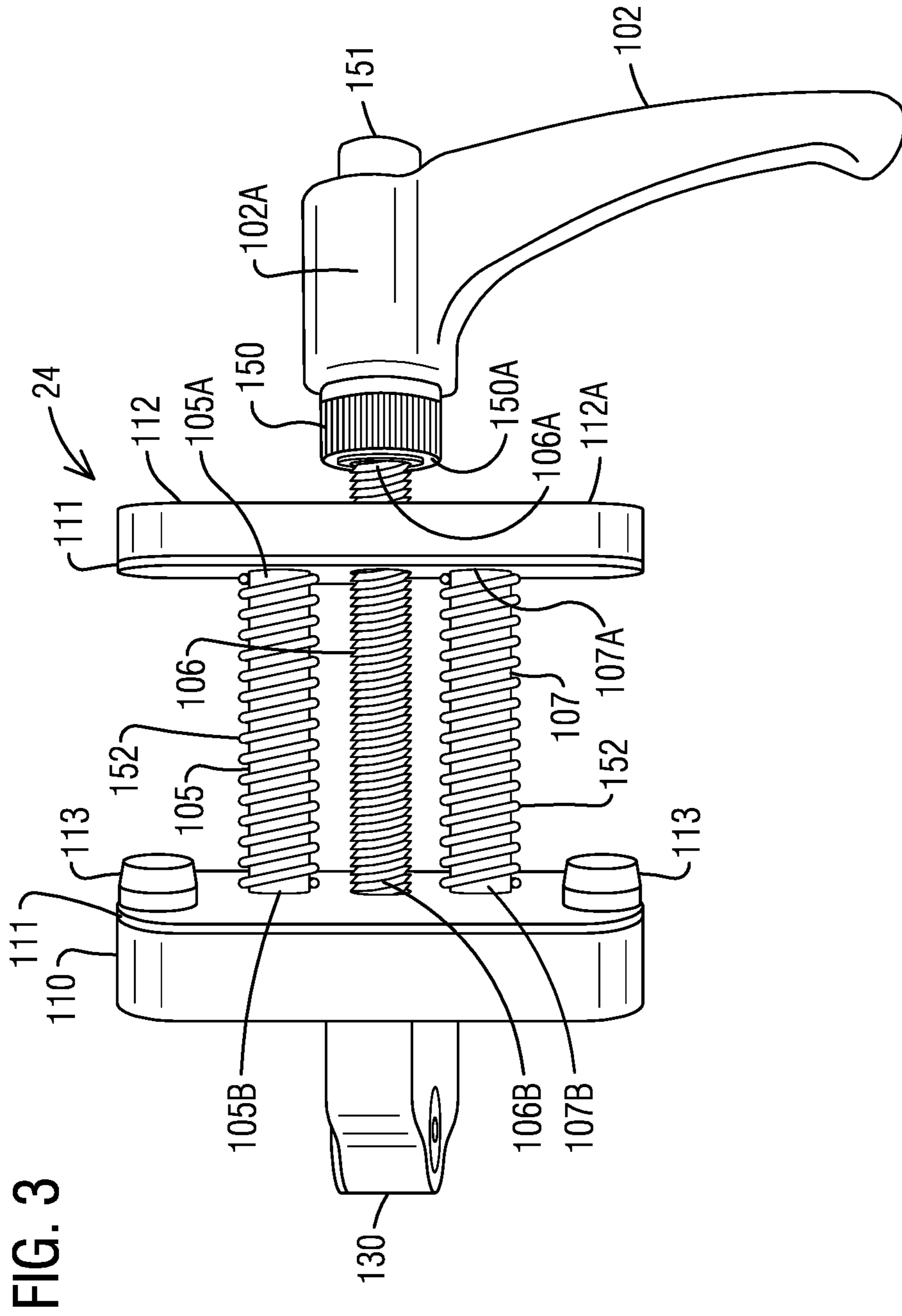


FIG. 4

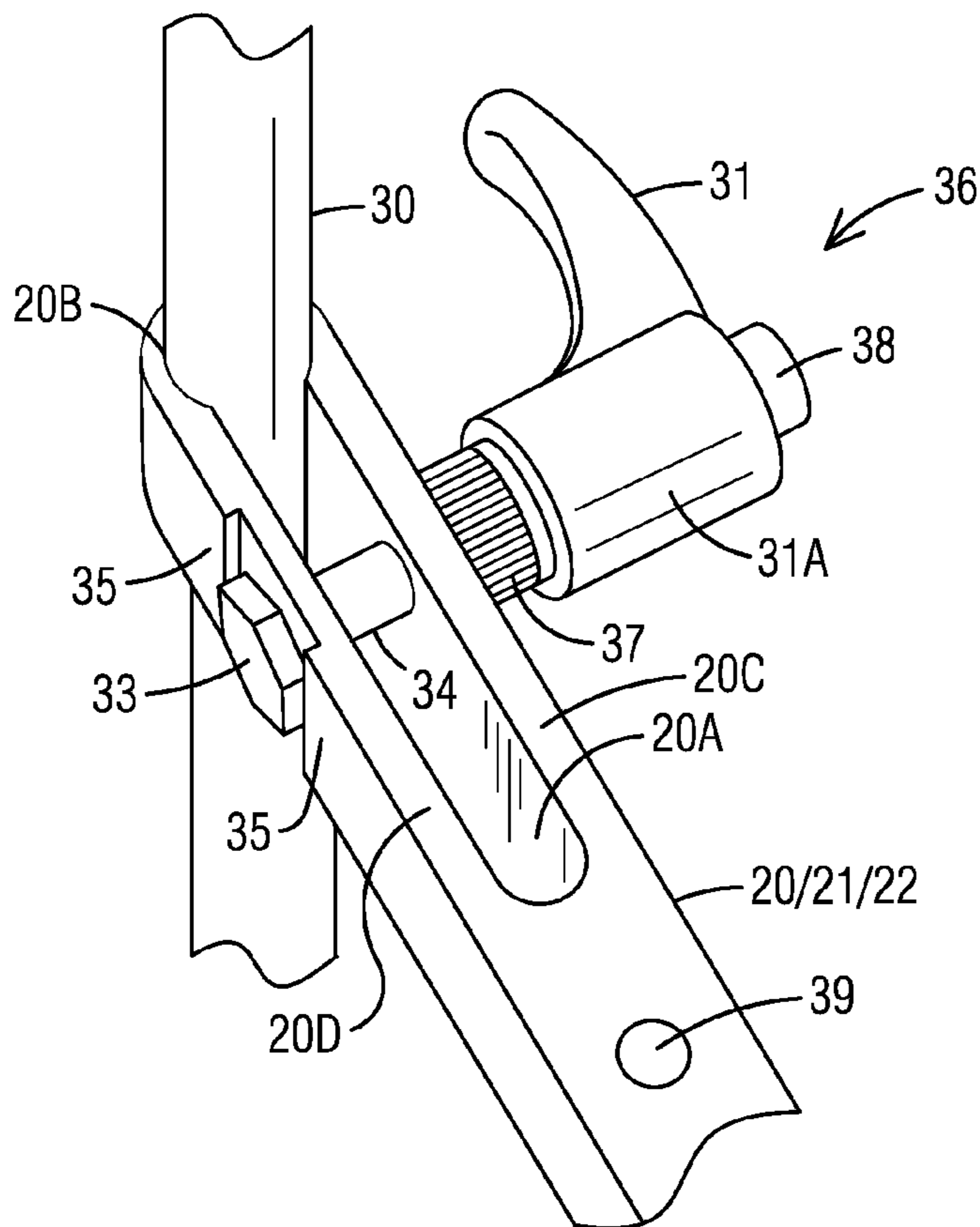
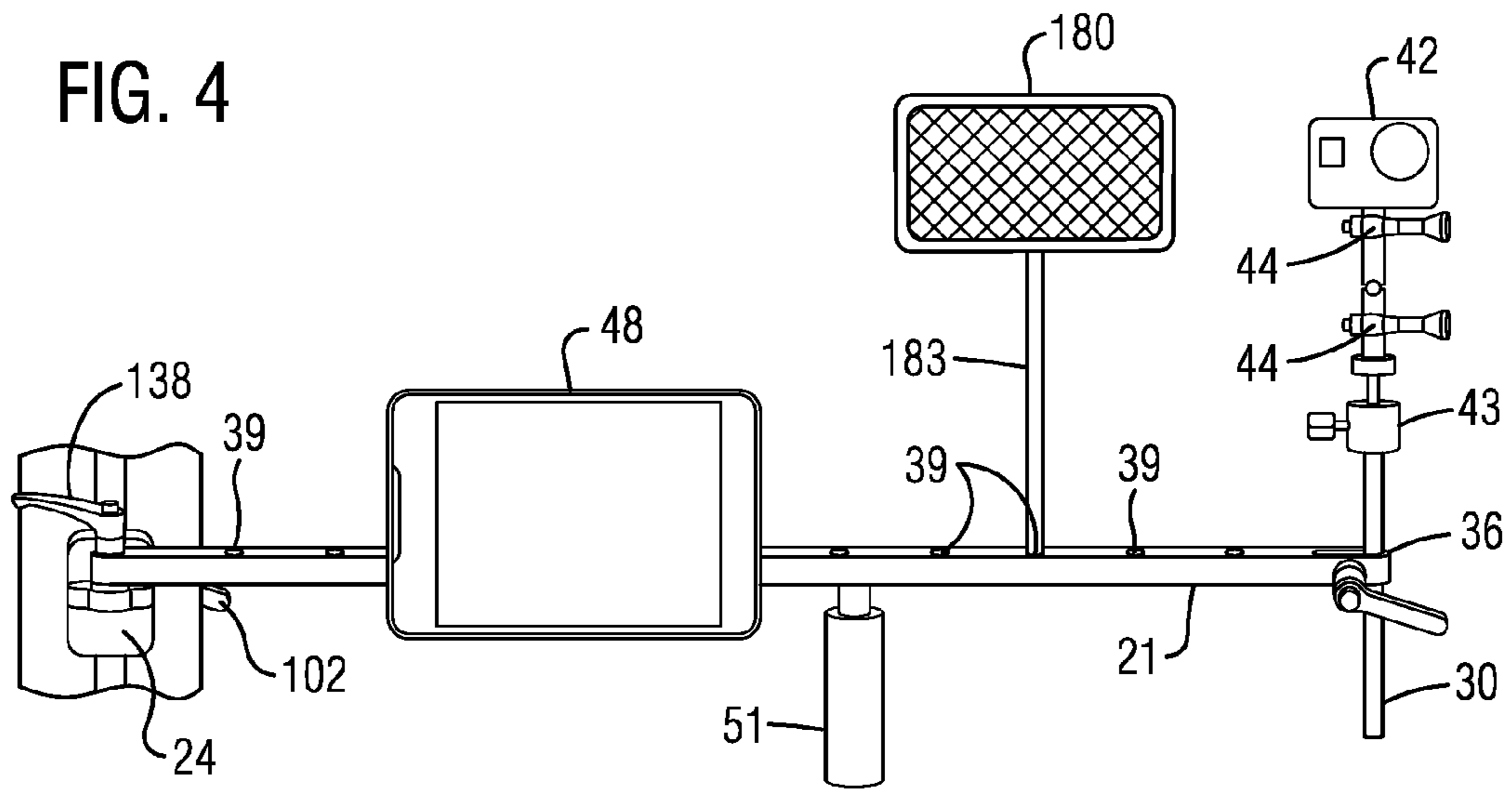


FIG. 5



FIG. 6

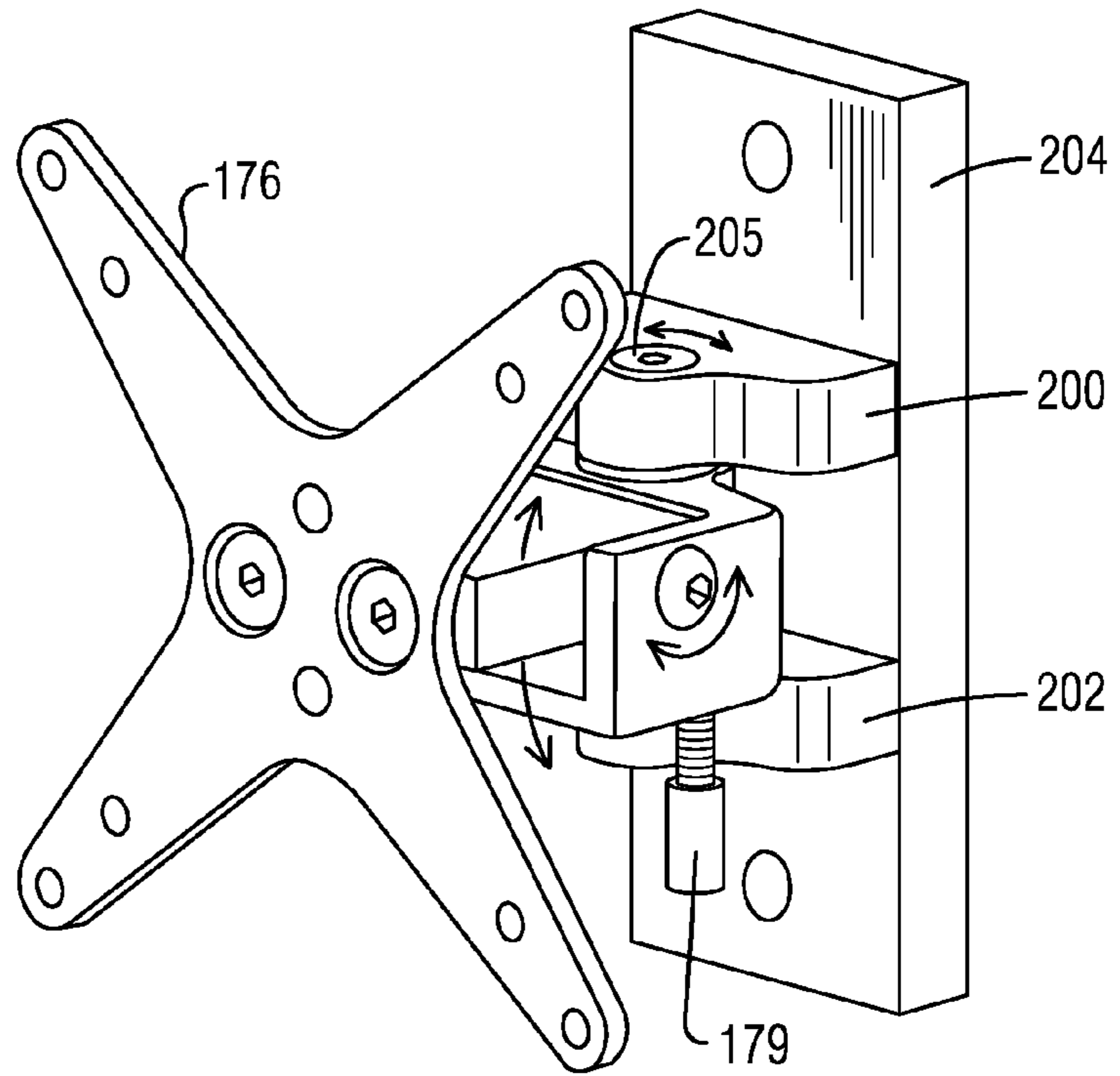
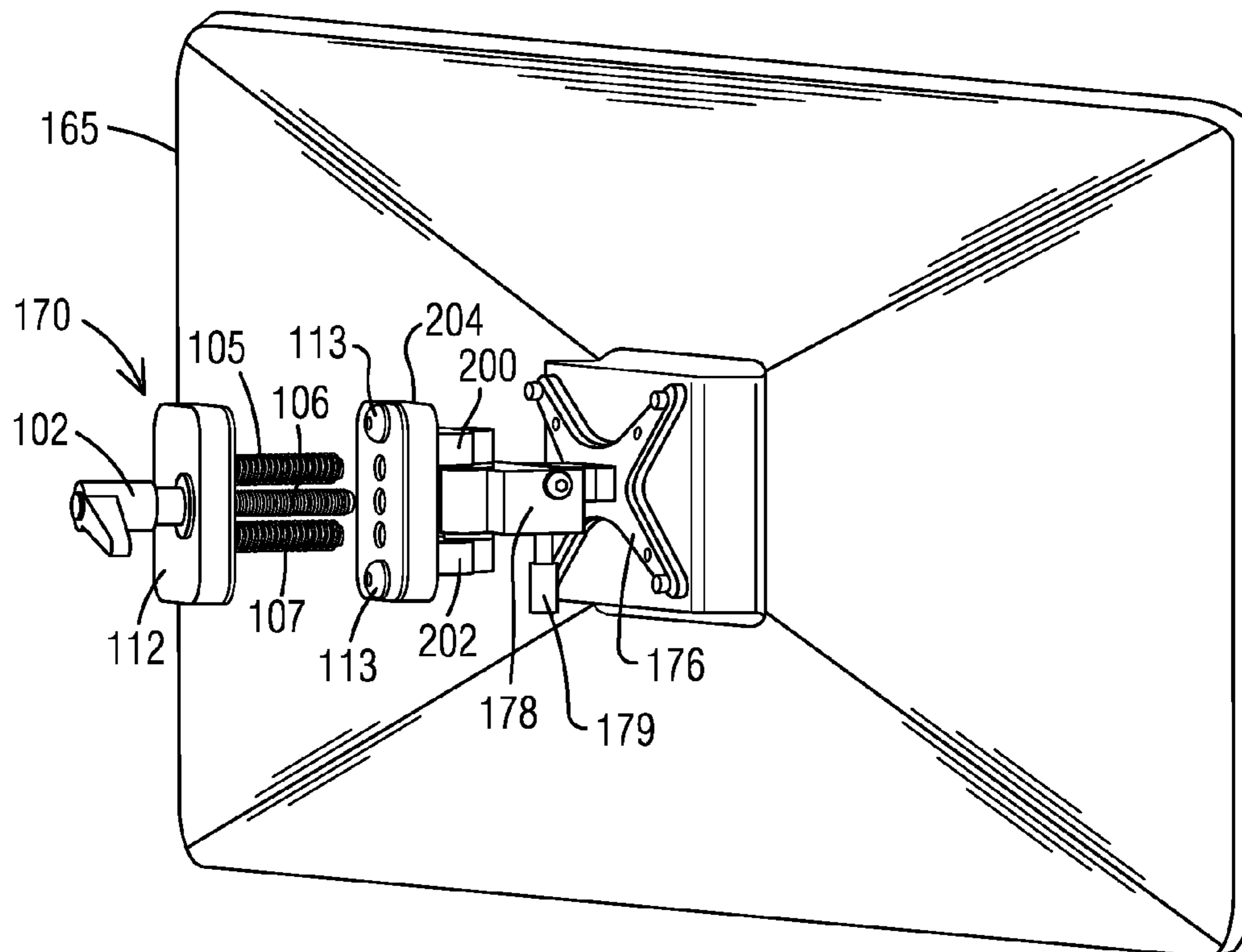


FIG. 7



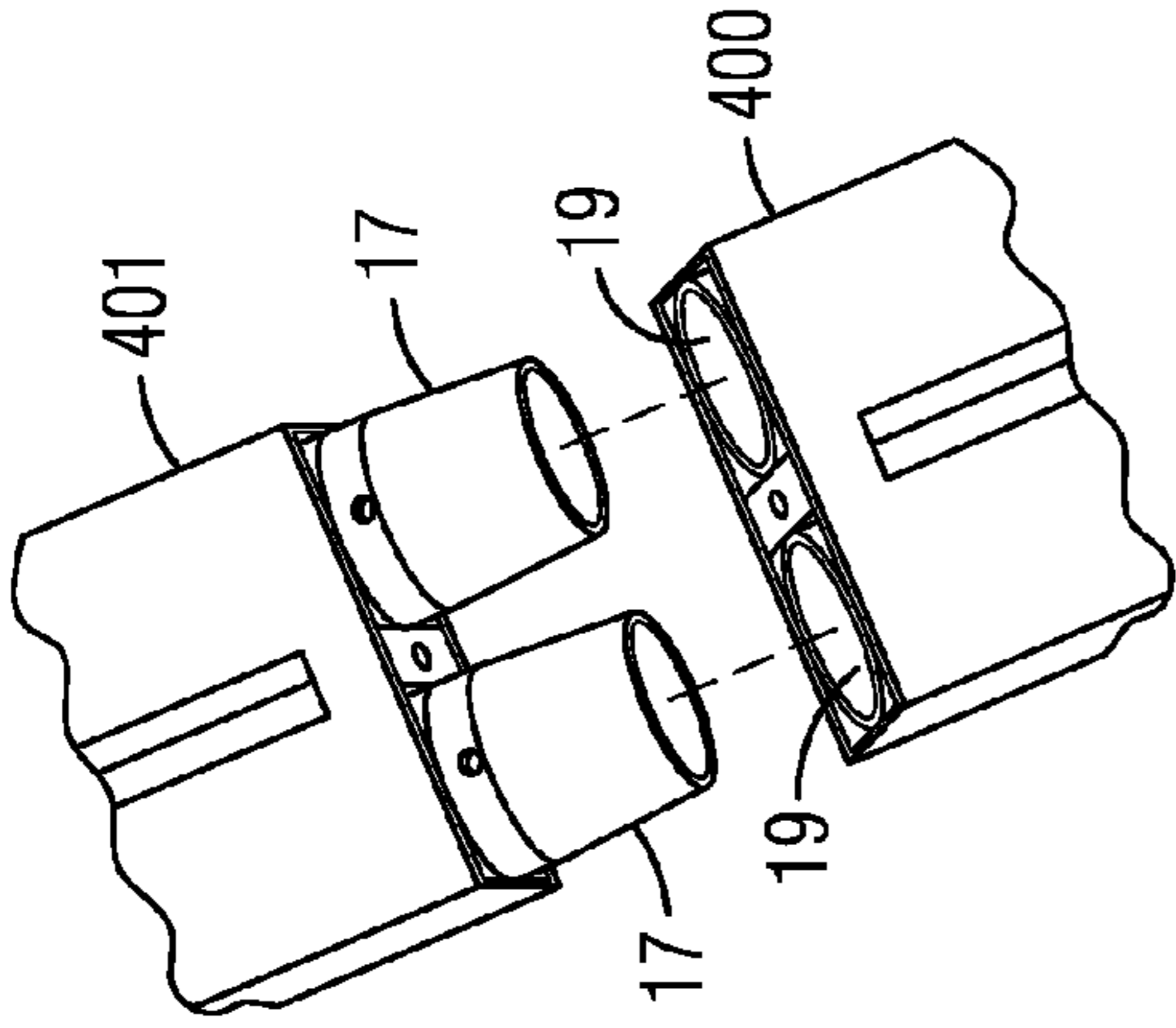


FIG. 9

FIG. 8

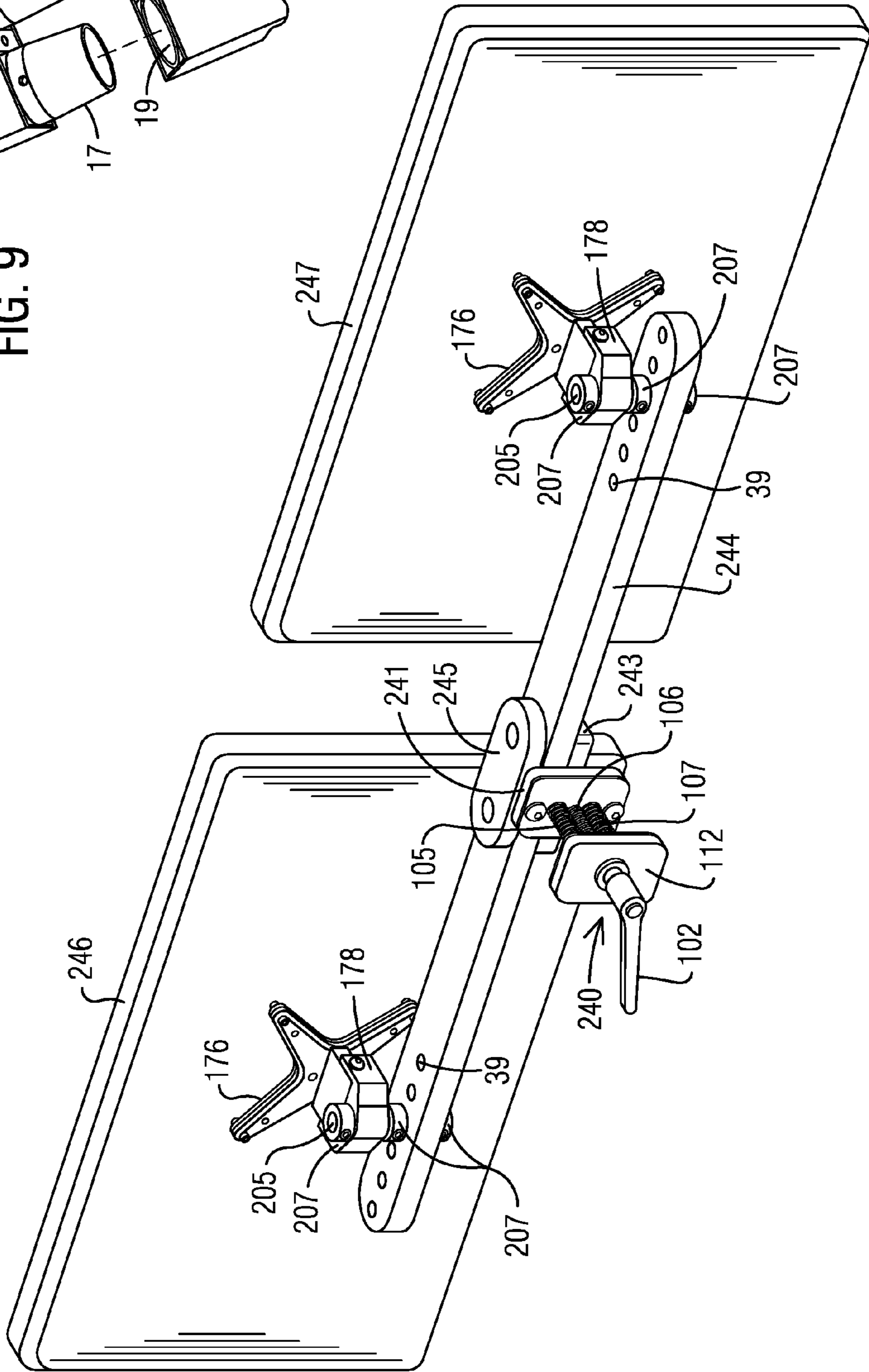


FIG. 8

FIG. 10

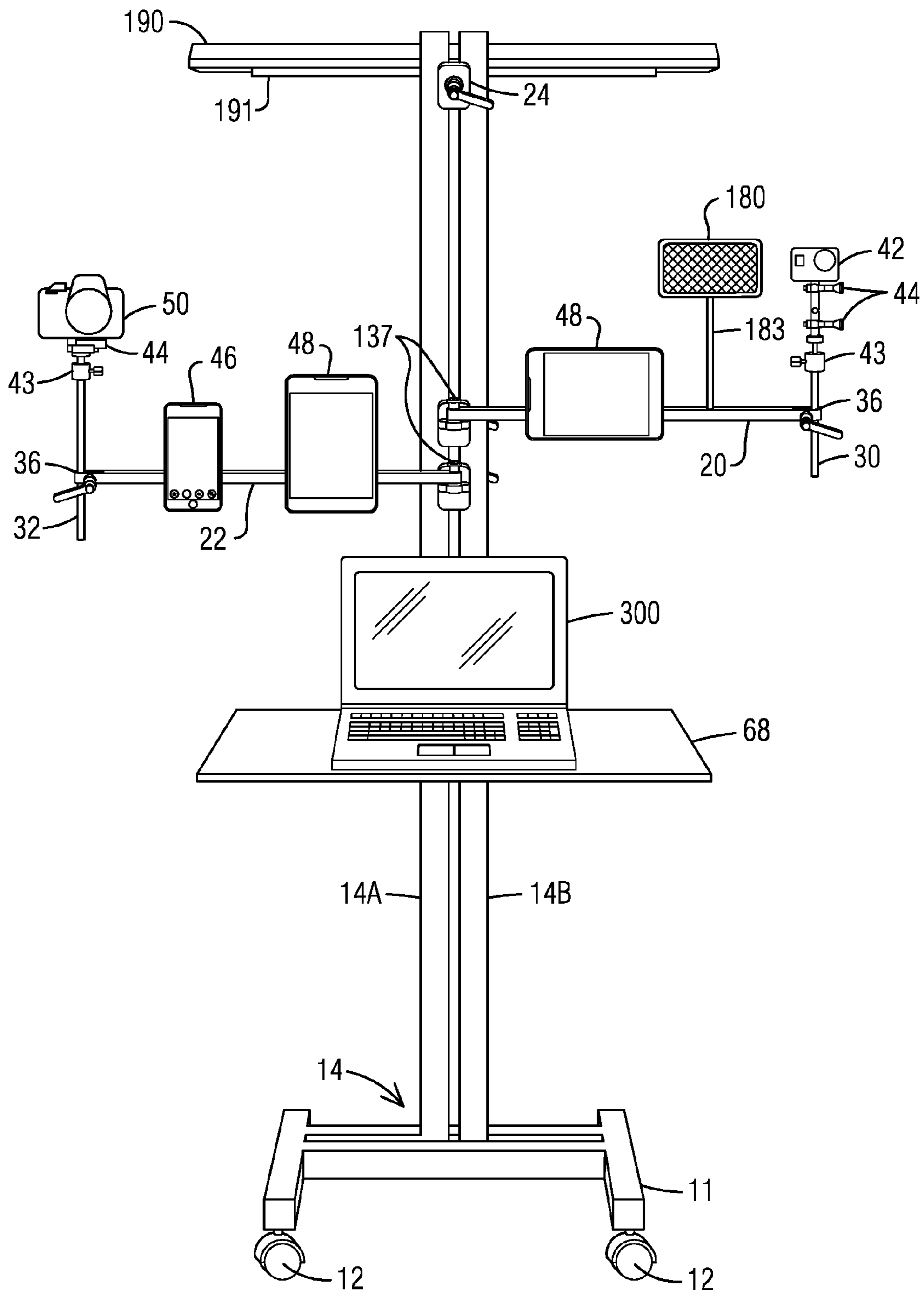


FIG. 11

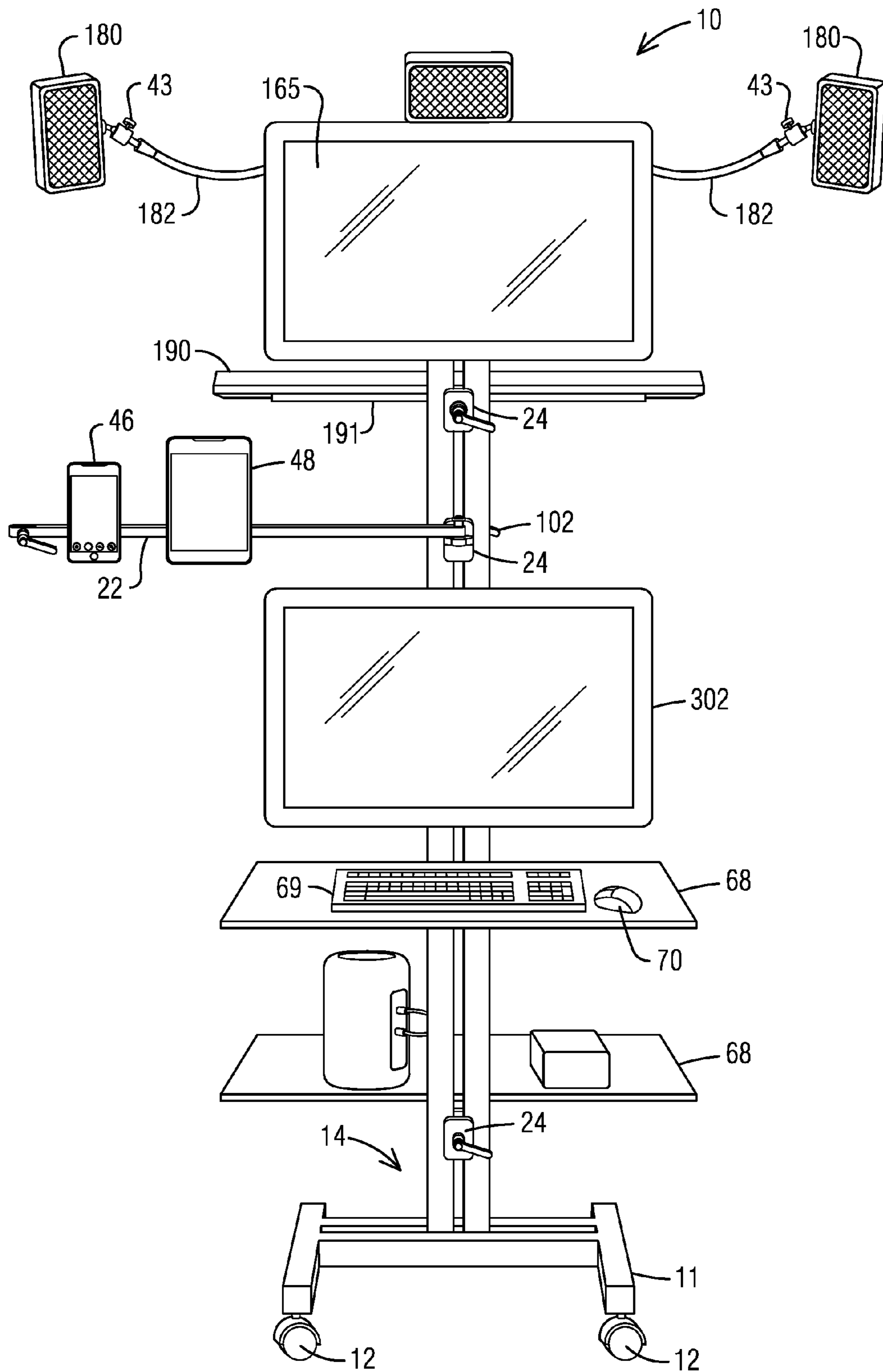
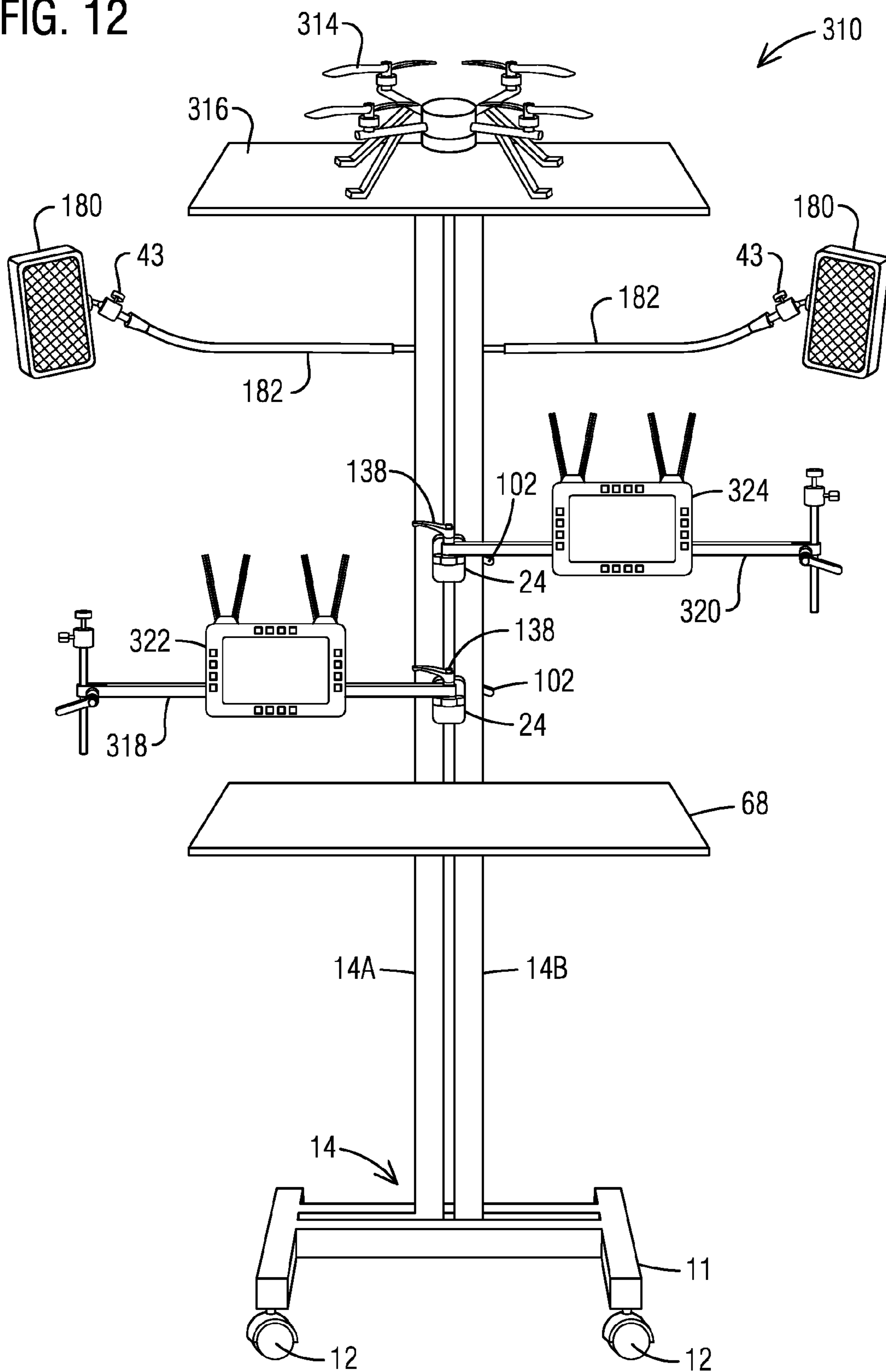


FIG. 12



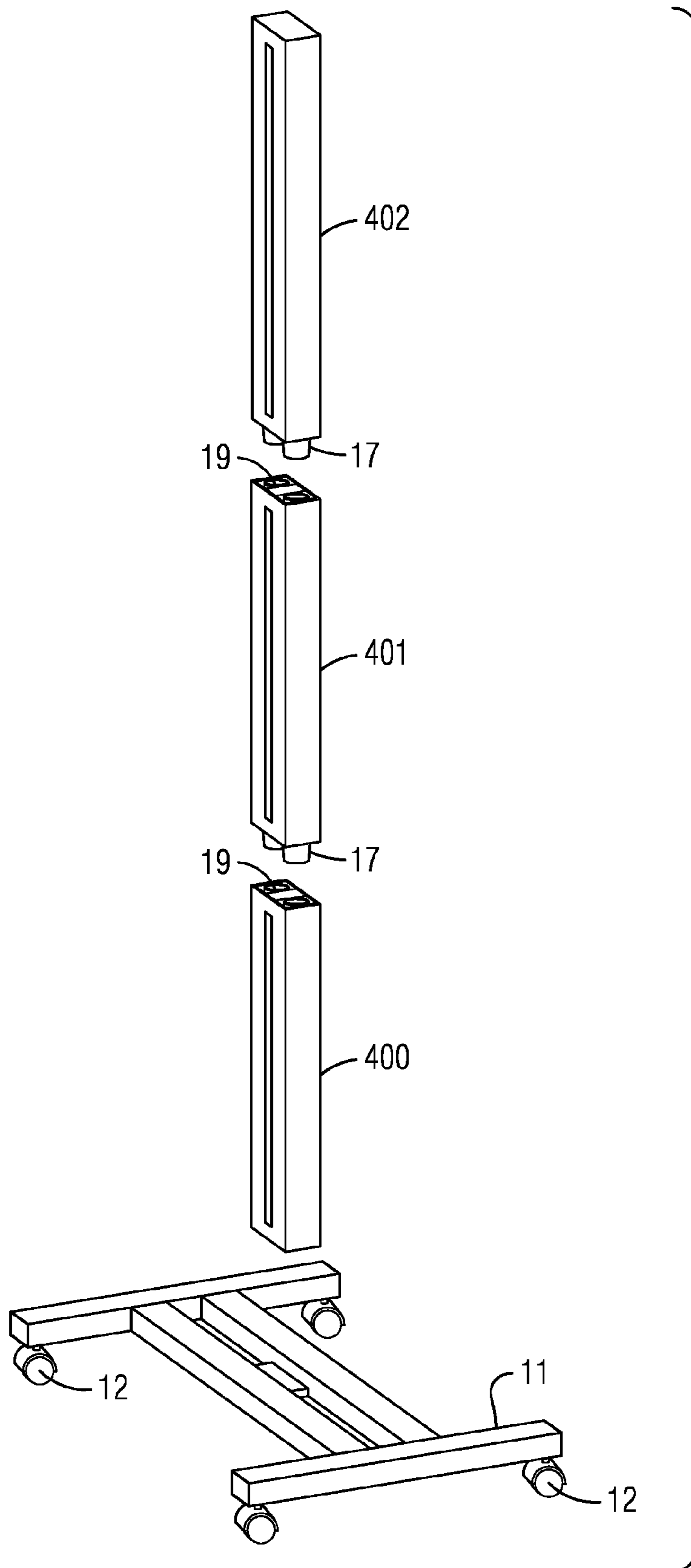


FIG. 13

FIG. 14

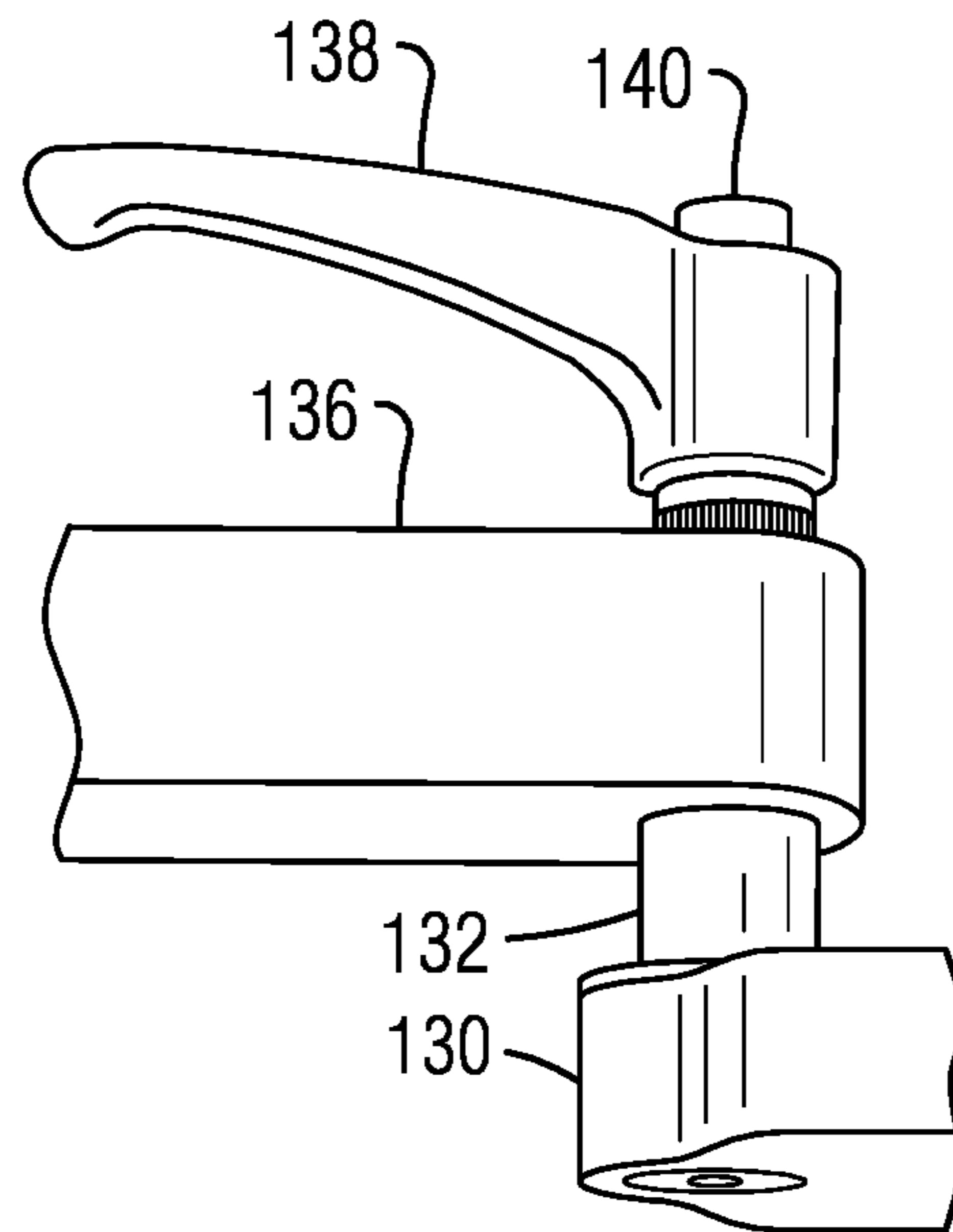
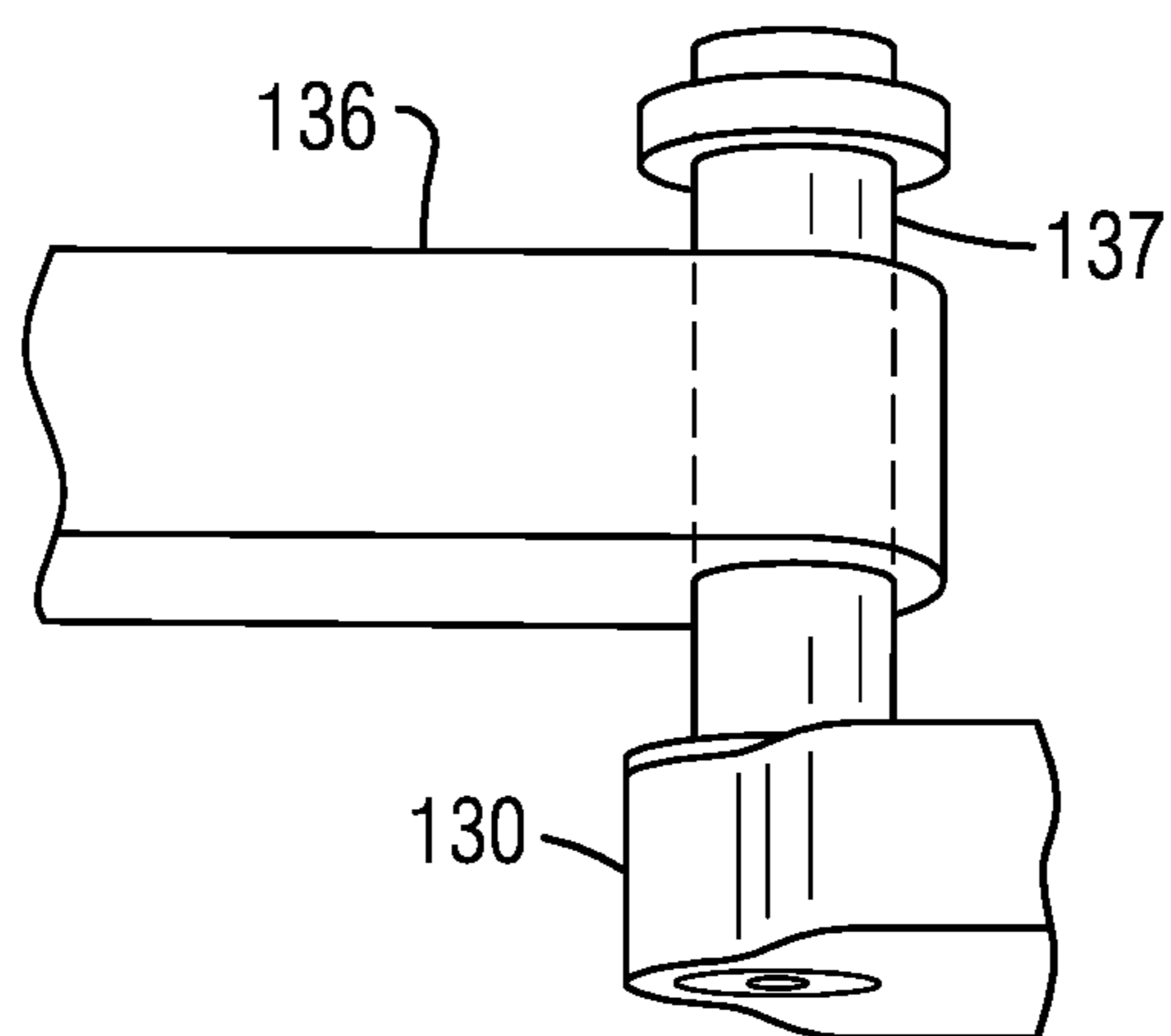


FIG. 15



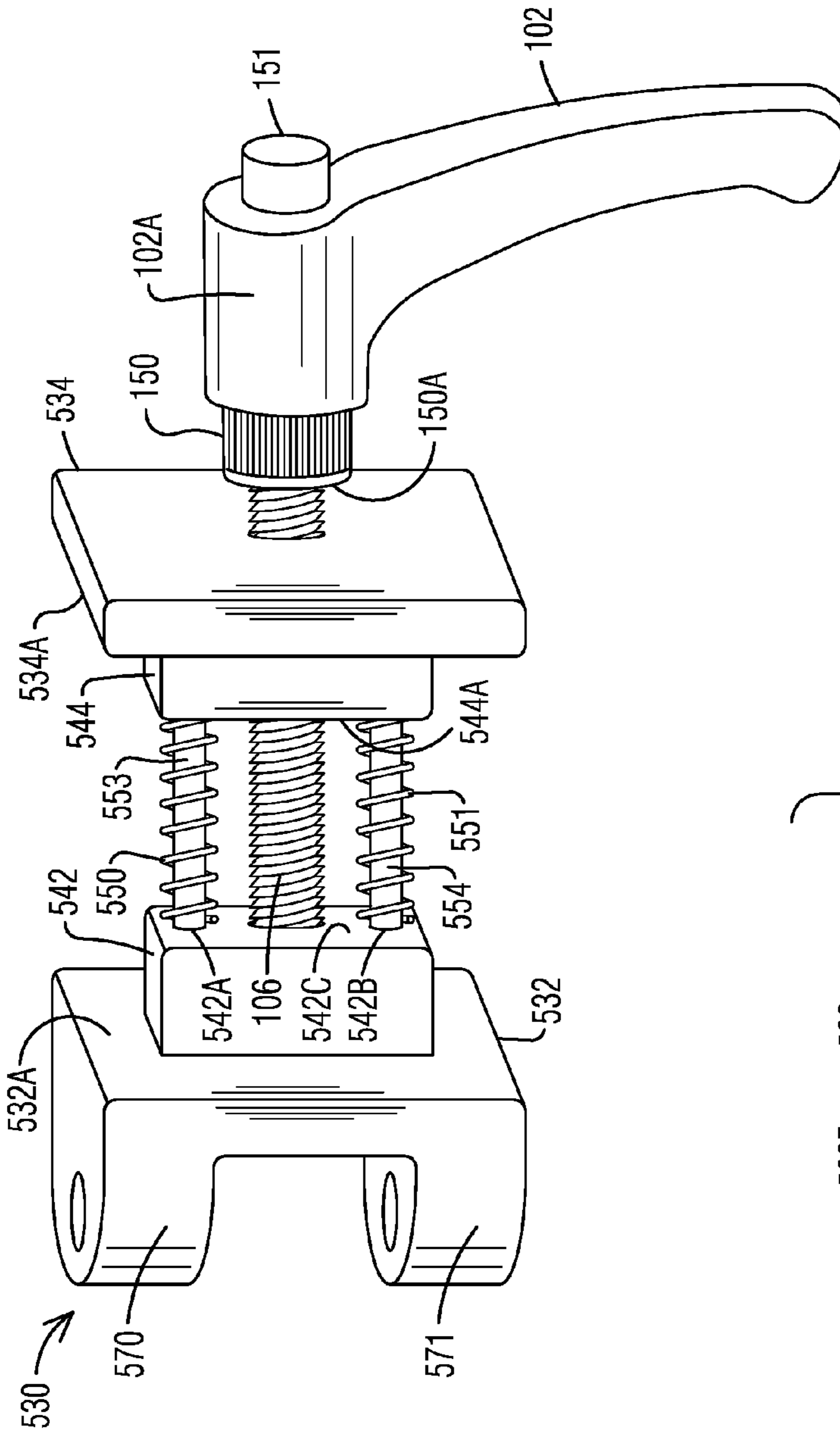


FIG. 18

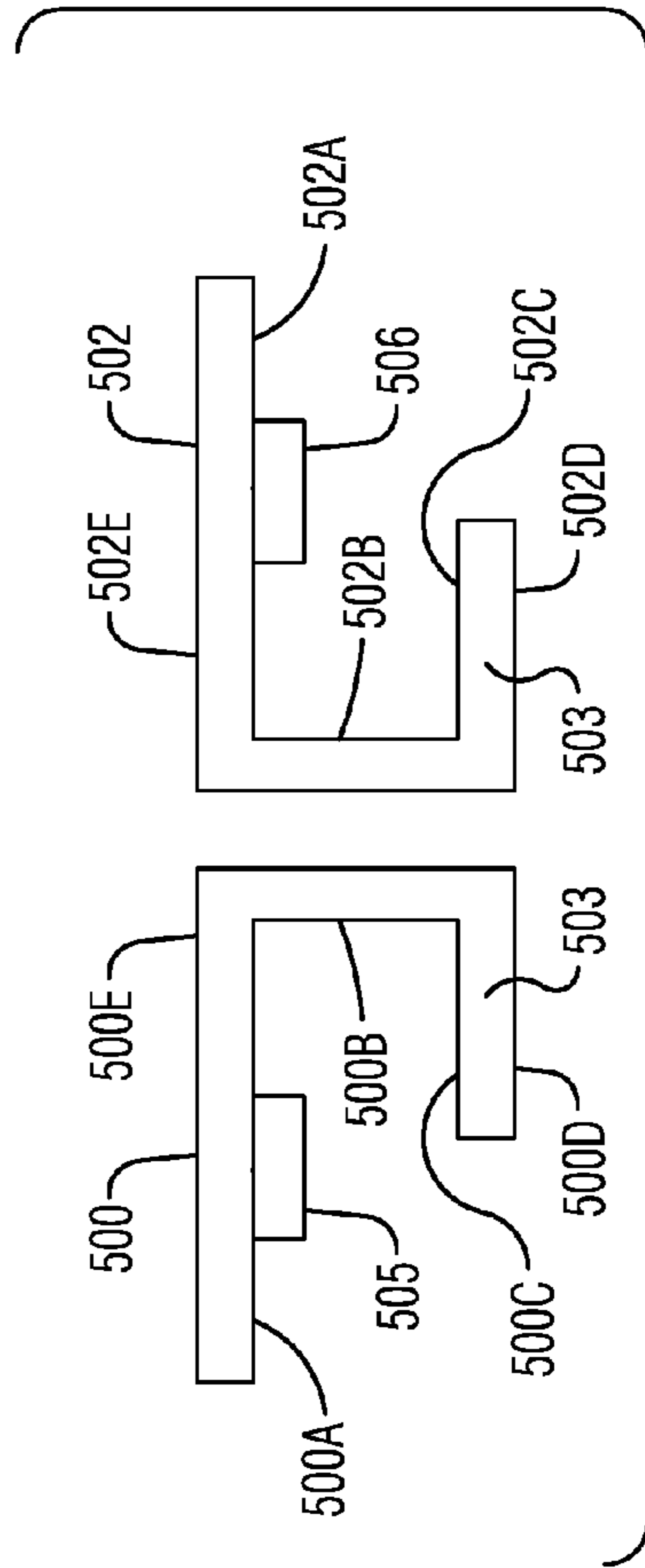
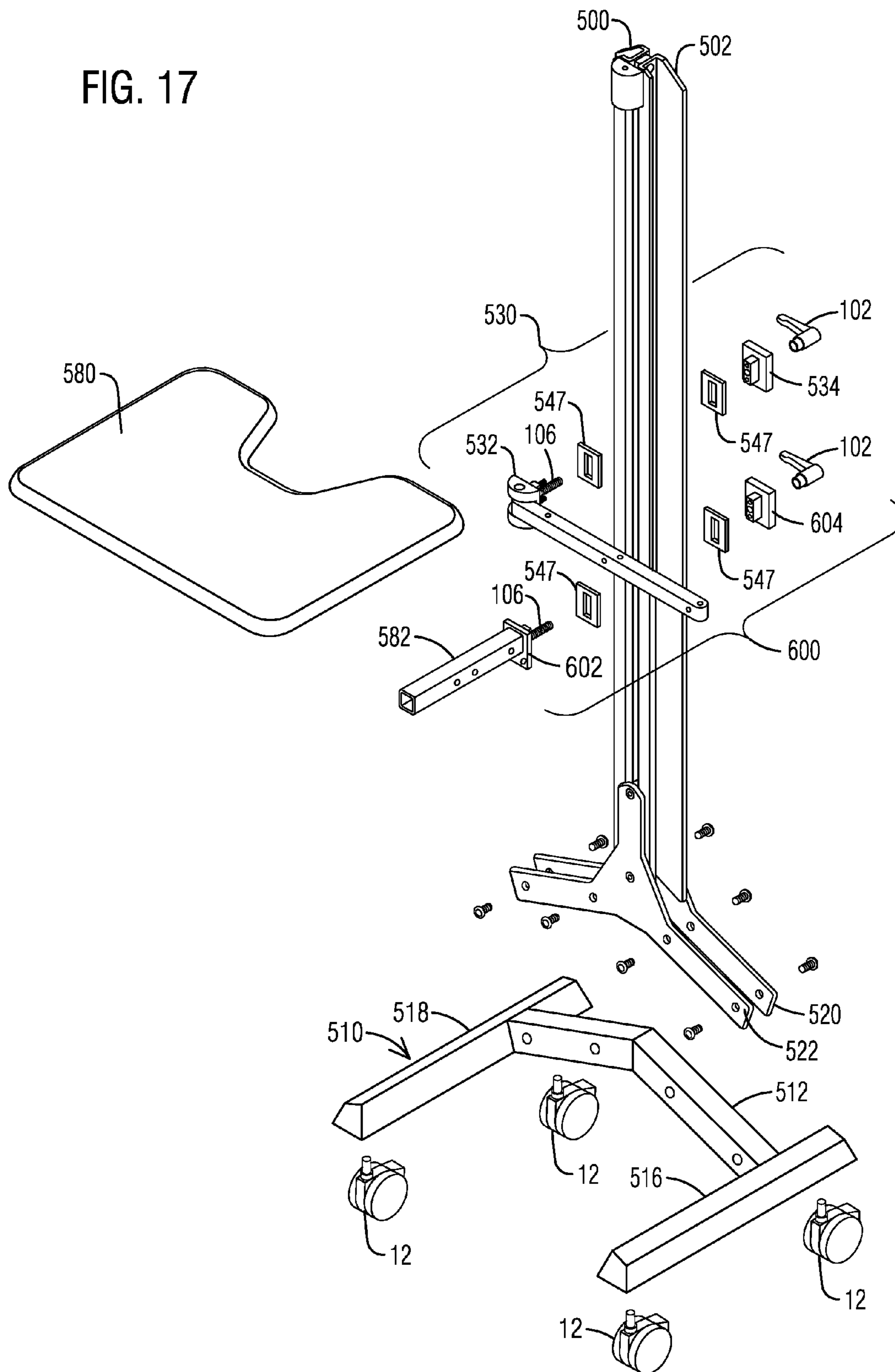


FIG. 16



FIG. 17



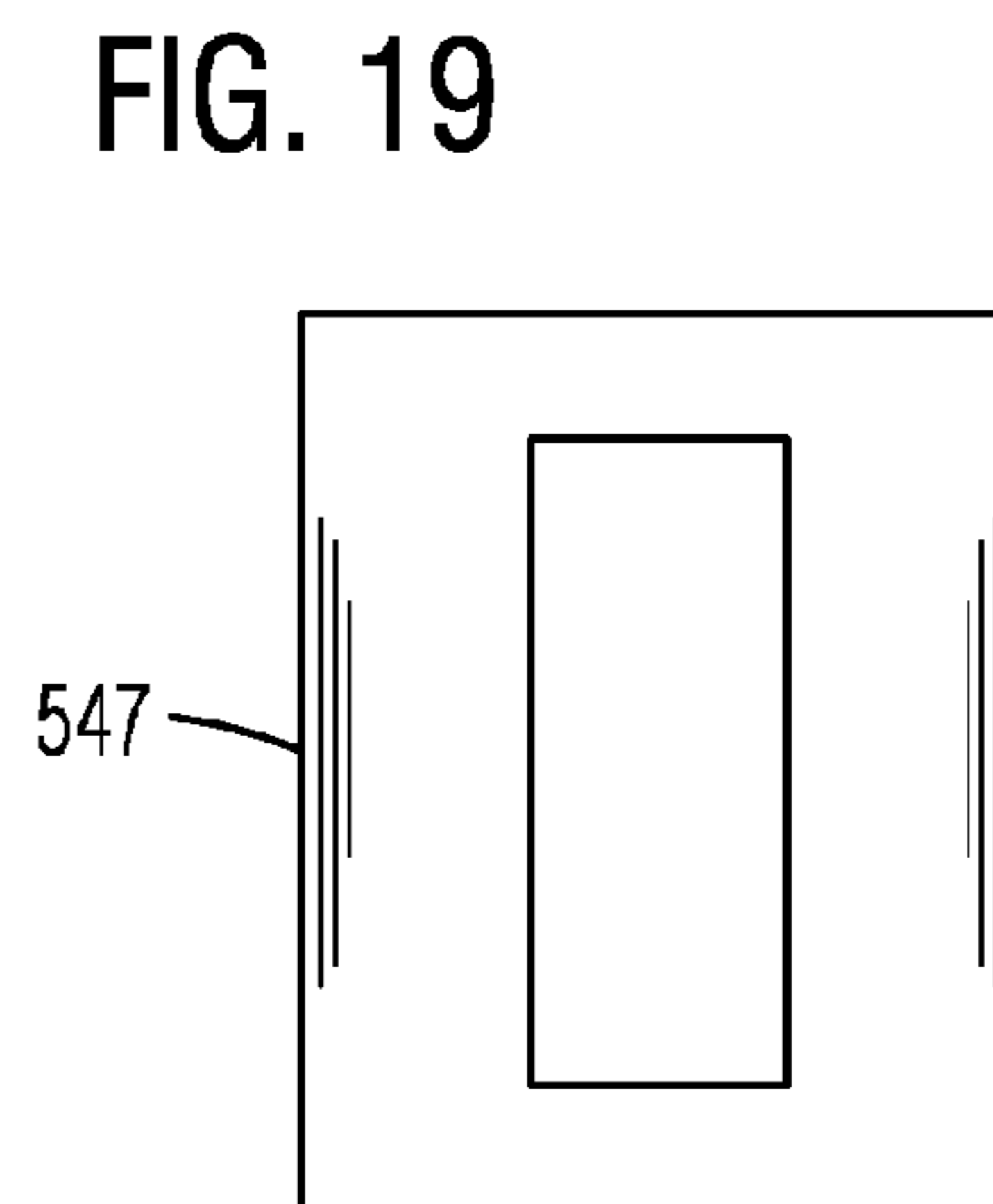
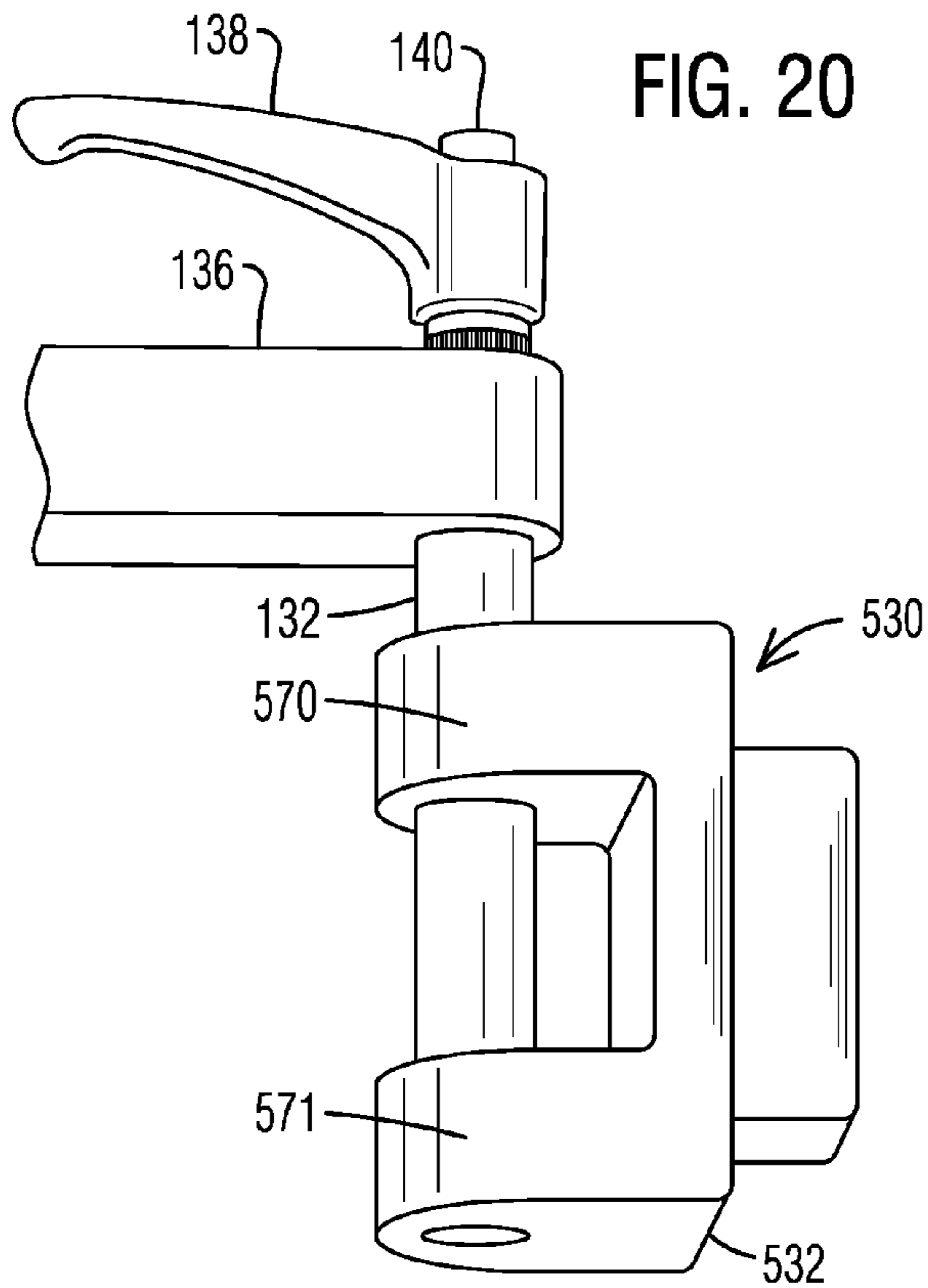


FIG. 21

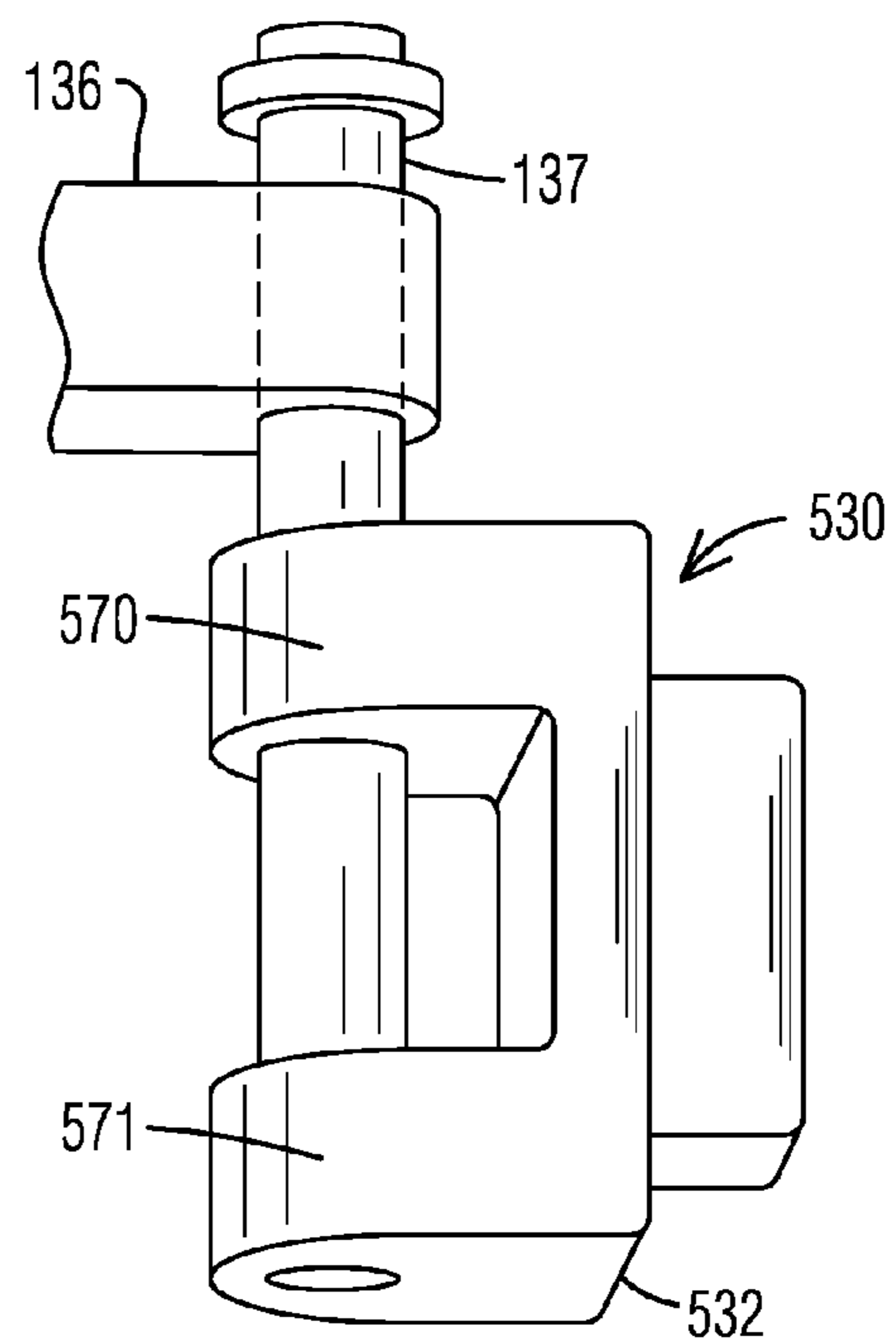


FIG. 22

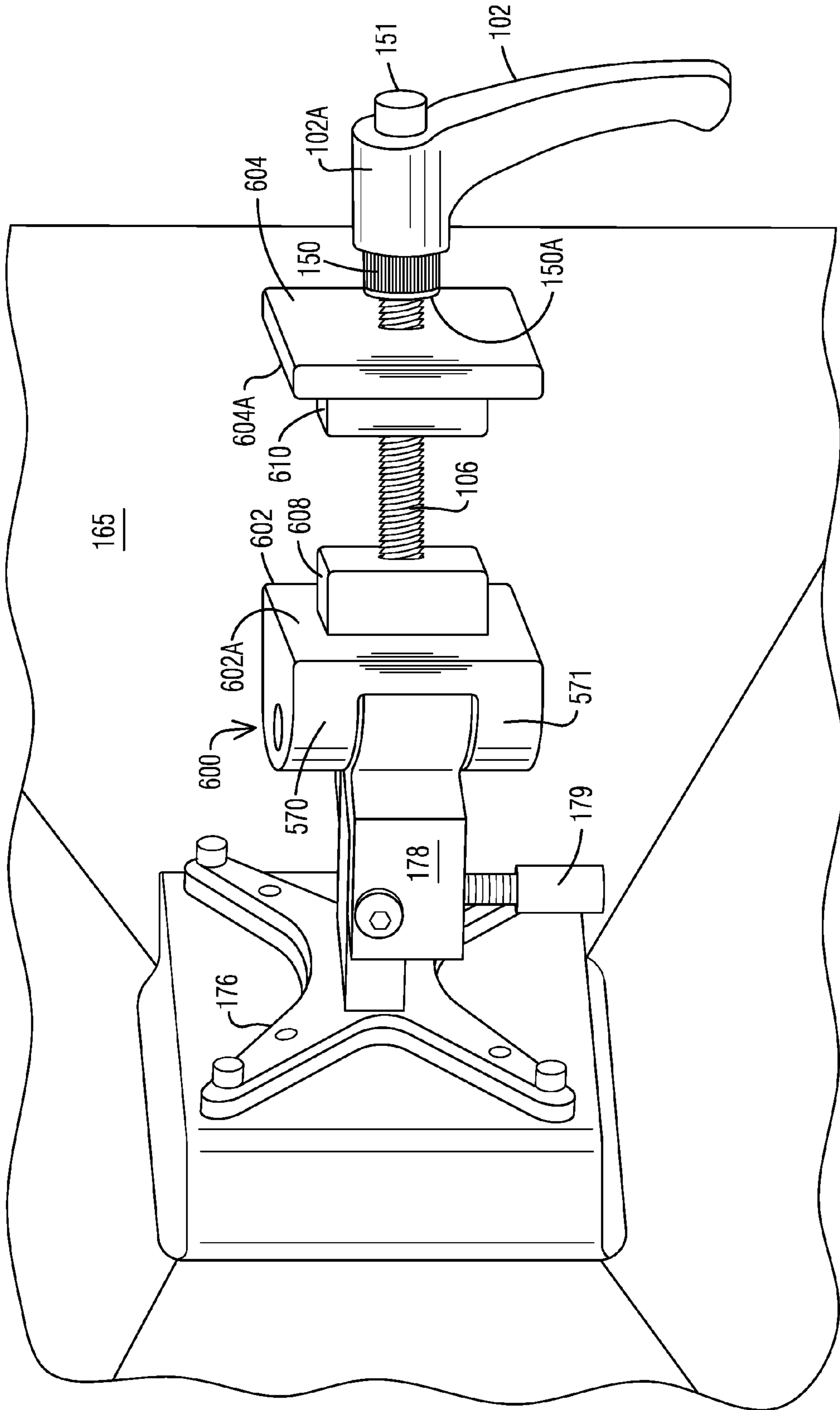
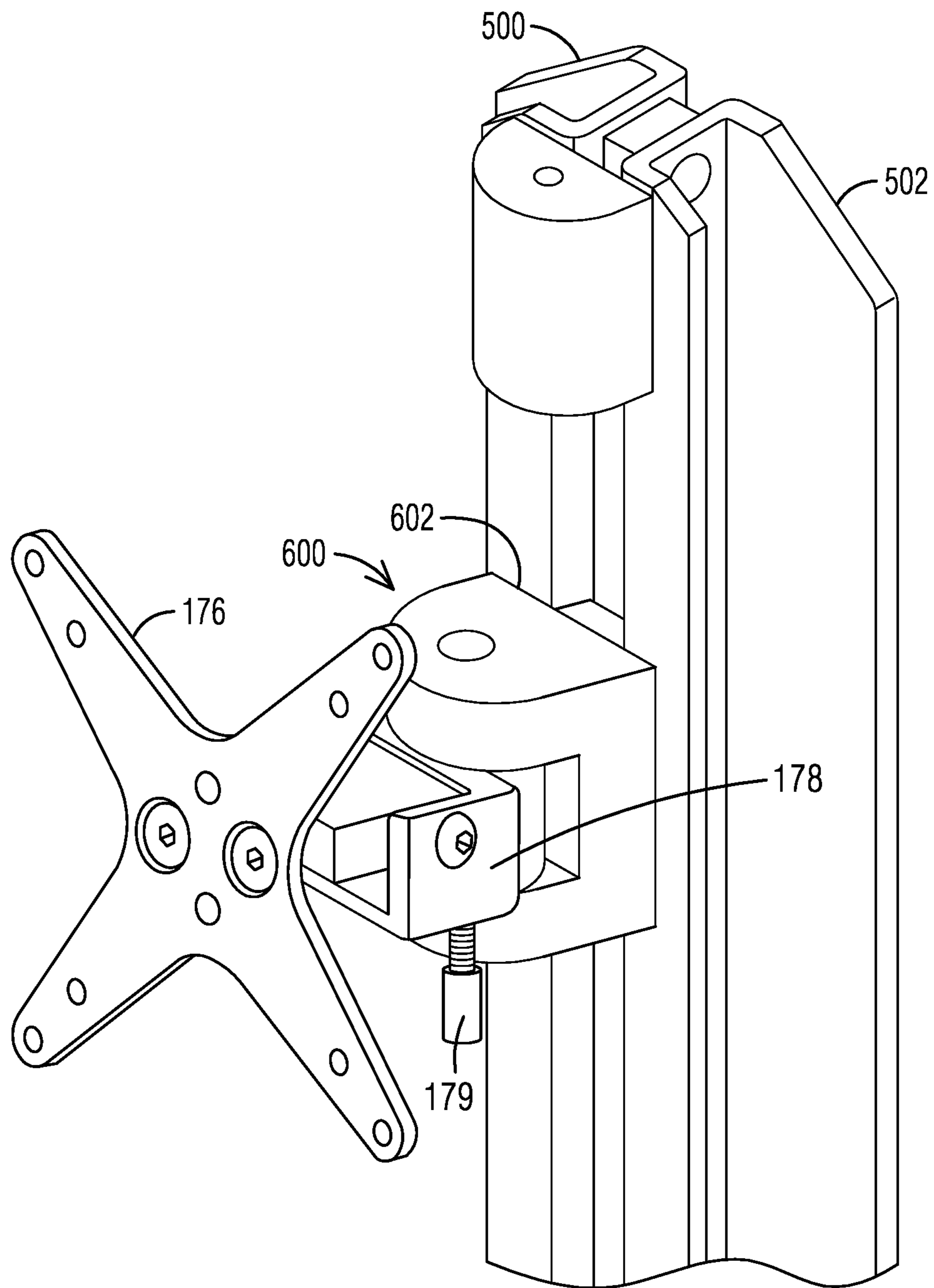


FIG. 23



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## MOBILE MULTIMEDIA WORKSTATION WITH NOVEL CLAMP

### FIELD

This invention relates to workstations, and more particularly, to a mobile multimedia workstation device having a flexible configuration and adaptable to accept and orient various devices, e.g., cameras, lights, platforms, smart phones, tablet computers.

### BACKGROUND

Most off-the-shelf (OTS) image capture solutions provide inaccurate lighting and poor color balance on subjects during photography, video capture, videoconferencing and remote graphics display. These prior art solutions also offer extremely poor control and stability for multiple cameras and devices when operated by an individual operator. Computer operators involved in capturing and processing video and graphics must frequently vary their position from sitting to standing during long-duration tasks. Professional production studios with their overhead costs are very expensive. Existing OTS products do not offer the flexibility and multiple features that may be required for a particular work environment, especially for an operator working alone.

As can be seen, there is a need for a mobile multimedia workstation device that solves the disadvantages described above by transforming a regular room without any video production capabilities into a studio-quality photography and video studio.

### BRIEF DESCRIPTION OF THE DRAWINGS

The invention is explained in the following description in view of the drawings.

FIGS. 1A and 1B are front views of alternative embodiments of a mobile multimedia workstation.

FIGS. 2A and 2B are partial rear views of the alternative embodiments of the mobile multimedia workstation of FIGS. 1A and 1B.

FIG. 3 illustrates a clamp of the mobile multimedia workstation.

FIG. 4 illustrates an arm for use in one embodiment of the mobile multimedia workstation of the present invention.

FIG. 5 illustrates a coupler for use with arm of the mobile multimedia workstation.

FIG. 6 illustrates a coupler having several degrees of freedom for use with the mobile multimedia workstation.

FIG. 7 illustrates a coupler attached to a monitor.

FIG. 8 illustrates two couplers attached to each one of two monitors.

FIG. 9 illustrates components associated with joints in the upright members of FIGS. 1A and 1B.

FIGS. 10, 11, and 12 illustrate other possible embodiments of the mobile multimedia workstation of the present invention.

FIG. 13 illustrates a sectionalized upright member of FIGS. 1A and 1B.

FIGS. 14 and 15 illustrate alternative embodiments for attachment components for the clamp of FIG. 3.

FIG. 16 is a top view of another embodiment of the upright members of the mobile multimedia workstation.

FIG. 17 is an exploded view of the upright members and associated components of the mobile multimedia workstation.

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FIG. 18 is a perspective view of another embodiment of a clamp for use with the mobile multimedia workstation.

FIG. 19 illustrates a shim or pad component for use with the clamp of FIG. 18.

FIGS. 20 and 21 illustrate alternative components for attaching to the clamp of FIG. 18.

FIG. 22 is a perspective view of yet another clamp for use with the mobile multimedia workstation.

FIG. 23 illustrates an application for the clamp of FIG. 22.

### DETAILED DESCRIPTION

The following detailed description is of the best currently contemplated modes of carrying out exemplary embodiments of the invention. The description is not to be taken in a limiting sense, but is provided merely for the purpose of illustrating the general principles of the invention, since the scope of the invention embodiments are best defined by the appended claims.

With reference to FIG. 1A, a mobile multimedia workstation 10 comprises a base 11 that may include at least one mobile component such as four caster wheels 12 or the like. The workstation 10 is mobile and therefore may be easily moved as needed.

Preferably a material of the base 11 comprises a strong, rigid material that provides stability and mobility for the workstation. The base 11 also provides substantial stability for any configuration of devices and any position and length of articulating and fixed mounts, arms and devices affixed to those mounts and arms.

An upright member 14 is attached to a top side of the base 11. Although the upright member 14 is depicted in FIG. 1 as comprising two proximate upright sub-members 14A and 14B, such is not required as one upright member may suffice. In other embodiments and applications three or more upright members or a single upright member may comprise the upright member 14.

The upright member 14 (i.e., the two upright sub-members 14A and 14B) may be offset slightly from a center of the base 11 toward a rear of the base (see FIG. 1A for example) so that the centers of gravity of the attached devices and the workstation structural members will be approximately centered between the wheels 12 when platforms, monitors, devices, etc. are mounted at various locations on the upright member 14 and at various distances from the upright member 14.

The base 11 may be filled with dense material to provide extra stabilization in applications where large masses (such as multiple monitors) are attached to upper regions of the workstation 10. In these applications the base 11 is sealed and capped to prevent spillage of the ballast material.

The upright sub-members 14A and 14B may have a square, rectangular or circular cross-sectional shape and may comprise telescoping or separable pieces, in modular fashion, for more convenient shipping or adjustment purposes.

In certain embodiments, the base 11 and the upright member 14 may be made from metal or the like. The material may be sandblasted, primed, coated and texture added. The base 11 and the upright member 14 may then be drilled, machined and tapped to prepare for assembly of the multimedia workstation.

In a preferred embodiment, the upright sub-members 14A and 14B form an assembly with the assembly further comprising three segments 400, 401, and 402 as illustrated in FIG. 13. The segment 400 is attached to the base 11.

FIG. 9 is a close-up view of the interface between the segments 400 and 401 and further illustrates protrusions 17 on the segment 400, for example, for receiving in openings 19 within the segment 401, for example. Mating of these protrusions and openings, as illustrated in FIGS. 9 and 13, firmly affix the segments 400, 401, and 402 to form the upright sub-members 14A and 14B.

The middle upright segment 401 of FIG. 13 can comprise either male or female joining members for joining with a converse component on the segments 400 and 402.

The upright member 14 (i.e., the upright sub-members 14A and 14B) provides, in its many different embodiments, stable, vertically adjustable, and/or telescoping attachment points for all shelves, arms, posts, etc., and all devices that may be rigidly or moveably affixed thereto. The attachment points may be affixed to a front or back surface of the upright member 14, thereby allowing full 360 degrees of freedom for articulating and moveable arms and mounts. The upright member may provide wire management and device connectivity via strategically placed cutouts, jacks, and plugs.

As described herein, the user may affix various devices to the upright member 14 using conventional components or using novel clamps and arms designed for use with the mobile multimedia workstation of the present invention.

With reference to FIG. 1A, arms 20 and 22 extend substantially horizontally from the upright member 14 and are attached to the upright member 14 by a clamp 24 disposed between the upright sub-members 14A and 14B and removably clamped against each of the upright sub-members.

The clamp 24 and its associated components allow the arms 20 and 22 to rotate about the upright member 14 and to be conveniently relocated to different locations on the upright member 14. Operation of the clamp 24 and its associated components is described further below.

FIG. 1A depicts an embodiment wherein the arms 20 and 22 are affixed to the upright member 14 with the clamp 24 and its first associated components in such a manner that the arms cannot be readily removed from clamp 24.

FIG. 1B depicts an embodiment wherein an arm 21 is affixed to the upright member 14 with the clamp 24 and its second associated components in such a manner that the arm 21 can be easily removed. But the arm 22 of FIG. 1B is attached to the upright member 14 in the same manner as depicted in FIG. 1A.

FIG. 3 is a detailed view of the clamp 24 comprising a quick release handle 102. Three rods 105, 106, and 107 are disposed between clamp faces 110 and 112. These three rods are used for alignment and clamping functions of the clamp 24 as described below.

An end 106B of the middle (fastening) rod 106 threadably engages a threaded opening in the clamp face 110 to fixedly attach the end 106B in the clamp face 110.

An end 106A of the rod 106 passes through an opening in the clamp face 112, threadably engages the clamp handle 102, and extends into an interior region 102A of the clamp handle 102.

An end 105A and 107A of respective alignment rods 105 and 107 is secured within respective openings in the clamp face 112. Each end 105B and 107B passes freely through a respective opening in the clamp face 110. Operation of the alignment rods 105 and 107 is described below.

A threaded fastener 150 serves as a threaded capture component for the rod 106.

As the handle 102 is rotated on the rod 106 in a first direction, the end 106A is driven into the interior region 102A. When a surface 150A of the threaded fastener 150

contacts a surface 112A of the clamp face 112, further rotation of the handle 102 moves the clamp face 112 toward the clamp face 110. However a length of the rod 106 is selected such that the handle 102 can be rotated only until a distance between the clamp faces is slightly less than a width of the upright member 14 (where the width is about two inches). That is, the handle 102 can be rotated until a compressive force is exerted between the clamp faces 110 and 112 when the clamp 24 is mounted on the upright member 14.

In an embodiment where the width of the upright member differs from about 2 inches the length of the rod 106 and the alignment rod 105 and alignment rod 107 must be changed to permit the clamp faces 110 and 112 to close with a separation distance less than the upright member 14.

Rotation of the handle 102 in a second direction opposite to the first direction drives the end 106A of the rod 106 out from the interior region 102A. With continued turning of the handle 102, eventually the handle is turned off from the rod 106.

A material sheet 111 (such as comprising a high-density thermoplastic material) is mounted to an inside-facing surface of the clamp face 110 and to an inside-facing surface of the clamp face 112. Alignment components 113 extend from the material sheet 111 on the clamp face 110.

When the clamp 24 is clamped to the upright sub-members 14A and 14B (see FIGS. 2A or 2B, for example) the alignment components 113 fit between the upright sub-members to align the clamp relative to the upright members. The material sheets 111 are then in contact with the upright sub-members 14A and 14B to prevent physical marring of the upright sub-members.

The two outside (alignment) rods 105 and 107 maintain alignment between the two clamp faces 110 and 112 and are also disposed between the upright sub-members 14A and 14B when the clamp 24 is clamped to the upright sub-members.

An end 105A and 107A of respective alignment rods 105 and 107 is secured within respective openings in the clamp face 112. Each end 105B and 107B passes freely through a respective opening in the clamp face 110. As the handle 102 is rotated and the clamp face 112 is driven toward the clamp face 110, ends 105B and 107B extend through their respective openings in and beyond (outboard of) the clamp face 110.

The rods 105 and 107 provide alignment between the two clamp faces 110 and 112. As the clamp face 112 moves toward the clamp face 110 the ends 105B and 107B extend through their respective openings and outside of the clamp face 110 (outboard).

One embodiment of the clamp 24 comprises a spring 152 concentrically mounted on each rod 105 and 107 to urge the clamp face 112 away from the clamp face 110 as the handle 102 moves away from the surface 112A of the clamp face 112.

A button 151 controls a clutch or ratchet associated with rotation of the handle 102 of the clamp 24. When the button 151 is pushed the handle 102 is disconnected from the threaded rod 106 (i.e., the clutch mechanism is disengaged), and the handle can be turned freely in either direction without movement of the rod 106 into or out from the interior region 102A of the handle 102. Typically the button 151 is pushed when the user desires to reposition the handle 102 to a better or more convenient position, e.g., to gain additional leverage in turning the handle.

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When the button **151** is released, the clutch engages and the handle **102** can be turned in either direction, i.e., turning the handle **102** on to or off from the threaded rod **106**.

The clamp **24** comprises a boss **130** affixed to an outside facing surface of the clamp face **110**.

In one application as shown in FIG. **14**, an opening within the boss **130** receives a rod **132** that passes through an arm **136**, for example. A quick release handle **138** is attached to the rod **132** above the arm **136**. The quick release handle **138** secures the arm **136** to the rod **132** and functions in a similar manner to the clamp **24**.

In another embodiment as illustrated in FIG. **15**, the opening within the boss **130** receives a pin **137** for attaching the arm **136** to the boss, and thus to the clamp **24**.

Thus the embodiment illustrated in FIG. **14** may be characterized as a quick-release embodiment as operation of the handle **138** allows quick separation of the arm **136** from the boss **130** and thus from the clamp **24**. But the embodiment of FIG. **15** does not include the quick release components and therefore cannot be characterized as a quick release attachment.

The arm **136** of FIG. **15** may be considered one or both of the arms **20** and **22** in the FIG. **1A** as in FIG. **1A** both arms **20** and **22** are attached to the clamp **24** using the pin **137** and the arms cannot be conveniently quickly removed from the upright member **14**.

The arm **136** of FIG. **14** may be considered the arm **21** of FIG. **1B** as in this Figure the arm **21** is attached to the clamp **24** with the quick release handle **138** and can therefore be easily disconnected from the boss **130** and therefore from the clamp **24**/upright member **14**.

As described further below, several devices are typically attached to the arm **21** of FIG. **1B** and these too can be easily carried about with the arm **21** after release from the upright member **14**. To facilitate carrying the arm **21**, as shown in FIG. **1B** the arm **21** comprises a handle **51** for carrying the arm and its attached devices. For example, it may be desired to separate the arm **21** from the upright member **14** by disconnecting from the clamp **24** to conveniently allow full mobility of the arm **21** apart from the workstation, such as for taking close-up photographs with the camera **42**.

In the front views of FIGS. **1A** and **2A** the clamp **24** is connected to each of the arms **20** and **22** with the handle **102** proximate a rear surface of the mobile multimedia workstation **10** and therefore nearly hidden from view in these front views. However, in use, one or both of the clamps **24** can be clamped to the upright member **14** from either the front or rear surface (i.e., the handle **102** can be located proximate either the front or rear surface of the upright member **14**) as determined by the configuration of the device or arm to be attached to the clamp **24**.

If it is desired to only vertically reposition the clamp **24**, the user turns the handle **102** to reduce the compressive force exerted by the clamp faces **110** and **112** on the upright member **14**, moves the clamp vertically, and finally re-clamps the clamp at a different location on the upright member **14** by tightening of the handle **102** to move the clamp face **112** toward the clamp face **110** and reapply the compressive force at this new location. It is not necessary to disassemble the clamp **24** if the user only wants to slide the clamp to a higher or lower position on the upright member **14**.

But if a device or component interferes with simply sliding the clamp up or down along the upright member **14**, or the user wants to remove the clamp **24** from the upright member **14** the user loosens and removes the handle **102**, removes the clamp face **112**, and finally removes the clamp

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face **110** from between the upright sub-members **14A** and **14B**. Of course, any devices attached to the clamp face **110** are also removed from the upright sub-members **14A** and **14B**.

Various arms (such as the arms **20**, **21** and **22** may be attached to the clamp face **110** and various devices may be attached to the arms.

Continuing with a description of FIG. **1A**, a smart phone **46** and an electronic tablet **48** (oriented in a portrait direction), such as an Apple iPad, are connected to the arm **22**. Another electronic tablet **48** (oriented in a landscape direction) is connected to the arm **20**. The electronic tablets **48** and the smart phone **46** are attached to their respective arms **20/22** using swiveling connecting members **47** as illustrated in the partial rear view of FIG. **2A**.

In FIG. **1A** posts **30** and **32** are vertically moveably affixed to an end of the respective arms **20** and **22** using a clamp **36**, which is further described below in conjunction with FIGS. **4** and **5**.

A camera **50** is attached to an end of the post **32** using connecting components **43**. Similarly, a camera **42** is attached to the post **30** using connecting components **43** and **44**. The clamps **43/44** permit easy removal and reattachment of the cameras **42** and **50**. Such clamps may have two or three degrees of freedom to position devices attached thereto. For example, the clamps **43** permit swiveling of any device attached thereto.

The various described devices are attached to their respective support members and arms using attachment components dependent on attachment features of both the device to be mounted and the support member to which it is attached. The attachment components may comprise strong magnets, non-damaging threaded clamps, standard camera mounts or the like, some of which are described in detail herein and represent inventive feature of the mobile multimedia workstation.

For example, with reference to the electronic tablets **48** or the smart phone **46**, the various adjustable features and adjustable mating joints (e.g., articulating arms) inherent in the mounting and attaching connecting members **47** (see FIG. **2A**) for these devices enable an operator to position these devices to view live on-screen images from a sitting or a standing position. As known by those skilled in the art, articulating arms and adjustable joints offer infinite adjustable positions (e.g., rotation, translation) for the components attached thereto.

Also, communications devices, such as the electronic tablet **48** and the smart phone **46**, whether communicating through a cellular over-the-air connection, a Wi-Fi connection, or another communications network, allow the operator to access the Internet, send and receive streaming data, and make and receive phone calls at the workstation **10**.

The spaced-apart distribution of the various components and devices attached either directly or indirectly to the upright member **14** permits maximum line-of-sight and prevents obstruction of viewing the various image-capturing devices mounted to the workstation. This distribution also permits maximum airflow between and proximate the components and devices for cooling purposes.

Returning to FIG. **1A**, shelves or platforms **68** are mounted to the upright member **14** at any desired vertical location along the upright member. The shelves may be rigidly affixed or vertically moveably affixed to the upright member **14** and the vertical position may be adjusted along the vertical axis of upright member. In one embodiment, the platforms **68** are each supported by an arm **96** that is in turn supported by the clamp **24** (see FIG. **2A**) attached to the

upright member 14. The arm 96 operating in conjunction with the clamp 24 allows raising and lower of the platform 96.

The platforms 68 may be used to support devices that typically rest on a flat surface during use and may be appropriate for devices such as, but not limited to, speakers, a computer, a keyboard 69, a mouse 70, and other items easily accessible from a seated or standing position. The shelves 68 may also be used for product photography, i.e., positioning a product on the shelf for taking a photo.

A monitor 165 may be attached to the upright member 14 using a coupler that allows swiveling and tilting (both left-right and up-down) of the monitor 165. One example of such a coupler is described below in conjunction with FIGS. 6 and 7.

Continuing with FIGS. 1A and 2A, light-emitting diode (LED) panels 180 may be attached (e.g., removably attached) directly to the upright member 14 or to other attachment mechanisms attached to the upright member 14. For example, the LED panels 180 may be connected to the upright member 14 (or to a mating member attached to the upright member 14) through the connecting components 43 and a gooseneck arm 182 that allow the angle, orientation, and position of the LED panel to be adjusted according to need. The connecting components 43 and the gooseneck arms 182 permit repositioning of the LED panels in any direction relative to the upright member 14.

The LED panels 180 may be of high-quality color and intensity and may be adjustable and may be used to supply accurate lighting with regard to color, temperature and contrast to provide studio-accurate color. Adjustment of the LED panels 180 can easily accommodate the photo subject and the ambient lighting in the environment.

In one embodiment, a sound bar 190 (see the front view of FIG. 1A and the partial rear view of FIG. 2A) sets on a shelf 191 that is moveably affixed to the upright member 14 through use of the clamp 24. The sound bar 190 can be adjusted vertically and horizontally and tilted to accurately image any sound environment for use in composing, playback, and recording. Thus, the workstation can function as a mobile recording studio.

Turning now to an alternative embodiment of FIGS. 1B (front view) and 2B (partial rear view), as described above, FIG. 1B depicts an embodiment with the arm 21 in lieu of the arm 20. The arm 21 carries the handle 51. Also in FIGS. 1B and 2B another LED panel 180 is attached to a post 183 that is in turn inserted into an opening 39 in the arm 21 or otherwise affixed to the arm 21.

With reference to the rear views of FIGS. 2A and 2B, each illustrates cut-outs or openings 25 through which wires and cables can pass for connection to the various electronic devices affixed to the mobile multimedia workstation 10.

FIG. 4 is a close-up view of the arm 21 illustrating in particular the openings 39, which are also defined in the arms 20 and 22 (see FIG. 2A and 2B where, for example, an end of each connecting member 47 is received within an opening 39). With respect to the arm 21, the rod 183 is received within one opening 39. Various styled pins and rods can also be inserted into the openings 39 for supporting various devices and components, including, for example, relatively small monitors.

FIG. 5 illustrates a close-up view of an end of the arm 20, for example, although the arms 21 and 22 may be similarly configured. The arm 20 defines an elongated slot 20A therein for receiving the post 30 within a notched region 20B of the slot 20A.

Rotation of a handle 31 along a threaded rod 34 (which is terminated in a bolt head 33 constrained from rotation by a collar 35) squeezes together segments 20C and 20D to tighten the post 30 within the slot 20A. When the handle 31 is loosened, the compressive force on the segments 20C and 20D is released and the post 30 can be raised or lowered vertically and rotated to provide an infinite range of positions and orientations for any device attached thereto.

Note that as the handle 31 is rotated and moves along the threaded rod 34, a segment of the threaded rod extends into a region 31A of the handle 31. Thus a length of the threaded rod 34 must be properly selected to ensure there is sufficient clearance for the threaded rod 34 as it extends into the region 31A so that a compressive force can be applied to squeeze the segments 20C and 20D.

A threaded fastener 37 serves as a threaded capture component for the handle 31 and the rod 34 and comprises serrated or flat surfaces that fit into a female receptacle (not shown) in the handle 31.

When the threaded fastener 37 is threaded out from the female receptacle the handle 31 can be turned along the rod 34 to reduce or increase the compressive forces exerted on the post 30 within the elongated slot 20A. The handle 31 and its threaded fastener 37 effectively makes the handle a nut that can be tightened or loosened on the threaded rod 34, driving the segment 20C toward 20D, thereby compressing the elongated slot 20.

A button 38 controls a clutch or ratchet associated with rotation of the handle 31. When the button 38 is depressed the handle 31 is disconnected from the threaded rod 34 (i.e., the clutch mechanism is disengaged), and the handle can be turned freely without movement along the threaded rod 34. Typically the user depresses the button 38 when she desires to reposition the handle 31 to a better or more convenient position, e.g., to gain additional leverage in turning the handle. When the button 38 is released, the clutch engages and turning the handle 31 moves the handle along the threaded rod 34.

With reference to FIGS. 6 and 7, a clamp 170 comprising certain components similar to the clamp 24, can be used for attaching the monitor 165 to the upright member 14. The clamp 170 differs from the clamp 24 of FIG. 3 in that the clamp face 110 having a single boss 130 extending therefrom in the clamp 170 has been replaced by a clamp face 204 having two spaced apart bosses 200 and 202 extending therefrom.

Like the clamp 24, the clamp 170 can be moved vertically along the upright member 14 by loosening, repositioning and then retightening the handle 102. This adjustment provision can accommodate a sitting or standing operator to provide convenient access to the monitor 165, for example.

With continuing reference to FIGS. 6 and 7, a four-armed plate 176 is attached to a back surface of the monitor 165 and attached to the bosses 200 and 202 via a moveable joint component 178. A pin 205 (see FIG. 6) passes through aligned openings in the bosses 200 and 202 and the component 178 to link the three components together. In one embodiment the monitor 165 can be tilted or swiveled along two axes by action of the moveable joint component 178. These movements are depicted by arrowheads in FIG. 6. An elongated thumb screw 179 depicted in FIGS. 6 and 7 is threadable into or out from the moveable joint component 178 to limit downward tilting of the moveable joint component and therefore the monitor 165 to which the moveable joint component is attached.

In addition to its use to support the monitor 165, the clamp 170 may be used to support a variety of devices such as



cameras, lights, tablet computers, and the like to position them in relation to one another with a high degree of flexibility in position, translation and rotation, while maintaining significant spatial stability and rigidity. For example, a large screen display or an equipment shelf may be mounted parallel to the floor and may require one or more axes of movement while a camera or a light panel may be mounted with multiple axes of movement.

FIG. 8 illustrates a clamp 240, similar in certain respects to the clamp 24 described above. The clamp 240 comprises the clamp face 112 and a clamp face 241 having a boss 243 extending therefrom. A bar 244 is captured and secured between the boss 243 and a plate 245, in one embodiment using machine bolts and mating nuts that pass through aligned openings in the plate 245, the bar 244, and the boss 243.

Two plates 176 are each individually attached to a rear surface of a monitor 246 and 247 and further attached to the moveable joint component 178. The pin 205 passes through an opening in each moveable joint component 178, similar to the arrangement of FIG. 6. Each moveable joint component 178 is secured to the bar 244 by inserting the pin 205 into an opening defined in each component 178 and into one of the openings 39 in the bar 244. Collars 207 attached to each pin 205 secure the pins within the openings.

In lieu of a single elongated bar 244, two bars placed end-to-end can be used with the two bars functioning as a single bar by joining the two bars between the plate 245 and the boss 243.

FIG. 10 illustrates an embodiment of the mobile workstation of the present invention for supporting a laptop computer 300 on the platform 68. Like the other figures, FIG. 10 illustrates one of many possible variations for supporting various electronic devices by the multimedia workstation 10.

In the FIG. 11 embodiment a monitor 302 is attached to the upright member 14. In one embodiment the attachment components illustrated in FIG. 7 can be used to attach the monitor 302. With the dual monitors, the FIG. 11 embodiment may be especially attractive for use by gamers as the capability to tilt and swivel the monitors 165 and 302 may be advantageous.

FIG. 12 illustrates a drone controller station 310 comprising a drone 314 on a pad 316 for use as a landing and take-off surface. The pad 316 may be attached to the upright member 14 such as by using the arm 96 as illustrated in FIGS. 2A and 2B or by inserting a fastener through the pad 316 and affixing the fastener in a top surface of the upright member 14.

Arms 318 and 320 support respectively a drone controller 322 and a drone camera controller 324. The platform 68 can serve as an equipment platform for supporting various devices, such as a laptop computer, battery charger (for the drone battery) and a power supply. Certain drones employ a tether between the drone and the control station. This connection supplies motor power and can anchor and constrain the altitude and range of the drone.

The quick release handle 138 secures the arms 318 and 320 to the clamp 24 to avoid accidental disengagement of those two parts from each other.

The mobile multimedia workstation allows configuring and orienting various controlling, video, and audio devices associated with operation and control of the drone 314 (tethered or wireless). The video devices can be used to capture or receive streamed real-time imagery, video, and still photos as captured by a camera aboard the drone 314. Audio devices can capture and receive sound. As this

embodiment illustrates, the structural variability of the mobile multimedia workstation offers limitless supporting and attachment components for use with multiple devices in multiple configurations and orientations.

The wide range of available adjustments for the various devices attached to or extending from the upright member 14 permits a fine degree of control over device position and orientation. When used in a media environment, production parameters such as lighting color, lighting intensity, camera angles, camera positioning, comfort, productivity, mobility and the like can be conveniently adjusted.

To erect the workstation, the user may assemble the upright member; attach and adjust all attachment mechanisms, clamps and shelves; and attach and configure their electronic devices (such as cameras, microphones, displays, speakers, power supplies, wiring, computers, smart phones, tablets, computer peripherals, LED lights, and the like). Preferably, quick-release and three-axis adjustment of all devices is possible using various attachment components.

The invention may be used for photo and video recording; video teleconferencing; real-time video streaming; as a telecommuting platform with screen sharing, annotation, script or cue-card reading for narration or the like. The device is capable of assisting with: the production of artwork, video editing, photo editing, engineering drawings, cloud computing, software development, carriage and operation of medical equipment in health environments, mobile recording (such as document discovery matters, deposition video recording, video recording of document execution and training), close-up (macro) photography of a wide variety of subjects (such as food, items for sale online, items for sale in print catalogs or archival photography for insurance purposes), mobile presentations (of equipment and content), mobile computing, video teleconferencing and many other uses.

In yet another embodiment, the upright members present a J-shaped cross-section in lieu of the square or rectangular cross-section of the upright members 14A and 14B as in FIG. 13. With reference to FIG. 16, this top view depicts upright members 500 and 502 each having a J-shaped cross-section. A front side of the multimedia workstation is indicated by reference numeral 503. The upright members 500 and 502 can be formed as individual segments, similar to the segments 400, 401, and 402 of FIG. 13, or each of the members 500 and 502 can be extruded as a single unitary piece.

In one embodiment, the upright members are attached together using bolts and mating nuts or machine screws (not shown in FIG. 16) located at any point along the length of the upright members. To maintain the required distance between the upright members 500 and 502, one or more space-maintaining components (e.g., blocks or threaded elements) can be disposed between the two upright members at various locations along their length.

Illumination sources, such as a string of light emitting diodes (LEDs) 505 and 506, can be affixed to any of the surfaces 500A, 500B, 500C, 500D, and 500E of the upright member 500 and to any of the surfaces 502A, 502B, 502C, 502D, and 502E of the upright member 502. In the exemplary embodiment illustrated, the strings 505 and 506 extend vertically along the surfaces 500A and 500B. In a preferred embodiment, the LED strings 505 and 506 are disposed on the surfaces 500C and 502C.

In another embodiment, a reflective material is attached to one or more of the upright surfaces, in particular a surface opposite or at a right angle to the LED strings. In yet another embodiment LED strings are attached to the reflective

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material. The reflective material scatters light emitted from the LEDs and thereby provide a more efficient light source.

In another embodiment, the base **11** of FIG. **1** is replaced with a base **510** as shown in FIG. **17**. The base **510** comprises a cross-member **512** extending between two parallel and spaced-apart members **516** and **518**. Plates **520** and **522** are attached to opposing surfaces of the upright members **500** and **502** and attached to the cross-member **512** to secure the upright members **500** and **502** to the base **510**. Attachment mechanisms include bolts and weldments, neither of which are illustrated in FIG. **17**.

In yet another embodiment, the clamp **24** of FIG. **3** is replaced with a clamp **530** of FIG. **18**. The clamp **530** comprises clamp faces **532** and **534**, each having a respective inwardly-protruding block **542** and **544**. To attach the clamp **530** to the upright members **14A** and **14B** or to the upright members **500** and **502**, the blocks **542** and **544** are disposed between the upright members, one block extending into the open region between the upright members from the front side of the workstation and another extending from the back side of the workstation. Tightening of the handle **102** (by rotating the handle) brings the clamp faces **532** and **534** together for a snug fit around the upright members.

Other components associated with the handle **102** have structural and functional features as described elsewhere herein.

As shown in FIG. **18**, springs **550** and **551** surround respective rods **553** and **554**. One rod/spring combination is disposed within each of the openings **542A** and **542B** in the block **542** and extend to similar openings (not shown in FIG. **18**) in the block **544**. According to another embodiment a surface **542C** of the block **542** and a surface **544A** of the block **544** is slightly rounded or curved. A flat region is formed in each of those rounded or curved surfaces, with the openings for receiving the rods **553** and **554** formed in such flat regions. The flat surfaces allow easier insertion of the rods **553** and **554** into their respective openings.

The springs **550** and **552** (and the blocks from which they project) are disposed between the two upright members when the clamp **530** is attached to the upright members. When the handle **102** is turned to loosen the clamp **530** from the upright members, the springs **550** and **552** exert outwardly-directed forces to move the clamp faces apart and thereby allow easier vertical movement of the clamp **530** along the upright members.

A material exhibiting a reduced coefficient of sliding friction (Teflon® (a registered trademark of The Chemours Company (formerly DuPont) for example) may be applied to any surfaces of the clamp faces **532** and **534** and the blocks **542** and **544** that are in contact with either of the upright members. This material (not illustrated in FIG. **18**) facilitates easier vertical displacement or adjustment of the clamp **530** along the upright members.

In one embodiment, a pad **547** (see FIG. **19**) is placed in contact with one or both of surfaces **532A** and **534A** of respective clamp members **532** and **534**. When the clamps are fixed on the upright members **500** and **502**, the pads **547** are in contact with the upright members and can prevent marring of those surfaces. The pads may also stop unwanted sliding or slipping of the clamps along the vertical members.

Returning to FIG. **18**, an outwardly facing surface of the clamp face **532** comprises two spaced-apart bosses **570** and **571** with an opening defined in each.

With reference to FIG. **20**, the openings within the boss **570** and **571** receive the rod **132** that also passes through the arm **136**. As can be seen, the quick release handle **138** is attached to the rod **132** above the arm **136**. The quick release handle **138** secures the arm **136** to the rod **132** and functions as described elsewhere herein.

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In another embodiment as illustrated in FIG. **21**, the openings within each boss **570** and **571** receive the pin **137** for attaching the arm **136** to the bosses, and thus to the clamp **530**. The quick release handle is not present in the FIG. **21** embodiment.

FIG. **17** depicts certain elements (**102**, **534**, **547**, **106**, and **532**) of the clamp **530** of FIG. **18** in an exploded view.

FIG. **17** also depicts a table or platform **580** comprising a rail (not shown) on its bottom surface that slideably engages an arm **582** such that the table can be moved linearly along the arm. In one embodiment, the arm **582** is attached to the upright members **500** and **502** with a clamp **600**. The clamp **600** is an alternative embodiment for the clamp **530** of FIG. **18** and the two clamps **530** and **600** are interchangeable when used on the mobile multimedia workstation of the invention. For example, the clamp **600** may be used to connect the bar **136** of FIGS. **14** and **15** to the upright members. In this embodiment the boss **130** in both FIGS. **14** and **15** is replaced by bosses **570** and **571**, which are components of the clamp **530** of FIG. **18**, or of the clamp **600** of FIG. **22**.

The clamp **600** is shown in an exploded view in FIG. **22**. As shown, clamp faces **602** and **604** are connected by the threaded member **106**. Blocks **608** and **610** extend from respective clamp faces **602** and **604**. The springs **551** and **552** and associated rods **553** and **554** (elements of the clamp **530** of FIG. **18**) are not present as in certain application they may not be necessary to urge the clamp faces apart to slide along the upright members. Thus, the openings **542A** and **542B** in the block **542** (and similar opposing openings in the block **544**) are also not present according to this clamp embodiment of FIG. **22**.

FIG. **23** illustrates the clamp **600** (only the clamp face **602** is illustrated) disposed between the two upright members **500** and **502**. The clamp face **604** is not visible in FIG. **23** but is disposed relative to the clamp face **602** as illustrated in FIG. **22**.

It should be understood, of course, that the foregoing description relates to exemplary embodiments of the invention and that modification may be made without departing from the spirit and the scope of the invention, as set forth in the following claims.

What is claimed is:

1. A mobile multimedia workstation comprising:
  - a base further comprising a bottom side and a top side;
    - at least one mobile component attached to the bottom side of the base;
  - first and second upright members attached to the top side of the base and spaced apart to define an opening therebetween;
  - a first clamp comprising first and second clamp faces connected by an adjustable connecting member extending through the opening defined between the first and second upright members, the adjustable connecting member adjustable to urge the first and second clamp faces in a direction toward each other to apply a compressive force between the front and rear surfaces of the first and second upright members thereby holding a vertical position of the first clamp along the first and second upright members;
  - a first arm having a first end connected to the first clamp face through a pivot junction and a second end defining a slot therein;
  - a first post for receiving within the slot;
  - a first device connected to the first arm;

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a threaded slot member disposed through the slot for adjusting a slot width to restrain the first post within the slot; and

the first clamp further comprising a first and a second protrusion each extending inwardly from the respective first and second clamp face, the first and second protrusions disposed within the opening defined between the first and second upright members when the first clamp is configured to apply a compressive force between the front and rear surfaces of the first and second upright members.

2. The mobile multimedia workstation of claim 1 wherein the mobile component comprises two or more wheel casters.

3. The mobile multimedia workstation of claim 1 the first and second upright members each comprising a plurality of separable upright segments having a protrusion in a first one of the plurality of upright segments for receiving with an opening in a second one of the plurality of upright segments.

4. The mobile multimedia workstation of claim 1 the first and second upright members each comprising a continuous length of material.

5. The mobile multimedia workstation of claim 1 further comprising a second clamp, an articulating arm attached to a first clamp face of the second clamp and wherein the articulating arm provides movement along at least one axis, the second clamp attached to one or both of the upright members or attached to the first arm.

6. The mobile multimedia workstation of claim 1 further comprising a platform attached directly or indirectly to the first and second upright members, the platform vertically adjustable by displacement along the first and second upright members and horizontally adjustable by changing a separation distance between the platform and the first and second upright members.

7. The mobile multimedia workstation of claim 6 the platform attached at any location along a length of the first and second upright members or atop the first and second upright members.

8. The mobile multimedia workstation of claim 7 the platform for use as a landing and a take-off surface for a drone, the workstation further comprising one or both of a drone controller and a drone camera controller moveably affixed to the first arm.

9. The mobile multimedia workstation of claim 1 the first clamp further comprising first and second biasing members disposed between the first and second clamp faces for urging the first and second clamp faces apart as the compressive force exerted by the first clamp is reduced.

10. The mobile multimedia workstation of claim 9 the first and second biasing members each comprising a helical spring.

11. The mobile multimedia workstation of claim 1 the adjustable connecting member comprising a threaded adjustable connecting member and the workstation further comprising a handle connected to the threaded adjustable connecting member, wherein rotation of the handle moves one or both of the first and second clamp faces in a direction toward each other.

12. The mobile multimedia workstation of claim 11 wherein the handle comprises a clutch handle and a handle button, a clutch of the clutch handle activated by depressing the button such that the handle can be freely turned without moving the first clamp face in a direction toward the second clamp face.

13. The mobile multimedia workstation of claim 1 the first clamp further comprising first and second bosses on an outwardly-facing surface of the second clamp face, the first and second bosses connected to the pivot junction for receiving the first arm.

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14. The mobile multimedia workstation of claim 1 further comprising a handle threadably engaging the threaded slot member for turning the threaded slot member for adjusting the slot width.

15. The mobile multimedia workstation of claim 14 wherein the handle comprises a clutch handle and a handle button, a clutch of the clutch handle activated by depressing the button such that the handle can be freely turned without turning the threaded slot member.

16. The mobile multimedia workstation of claim 1 the pivot junction comprising first and second bosses extending outwardly from the first clamp face and first and second openings defined in each of the respective first and second bosses, a third opening defined in the first end of the first arm, and a pin passing through the first, second, and third openings to attach the first arm to the first clamp face through the pivot junction.

17. The mobile multimedia workstation of claim 1 the pivot junction comprising first and second bosses extending outwardly from the first clamp face and first and second openings defined in each of the respective first and second bosses, a third opening defined in the first end of the first arm, a threaded pin passing through the first, second, and third openings, and a threaded handle threadably engaging the threaded pin to attach the first end of the first arm to the first and second bosses.

18. The mobile multimedia workstation of claim 1 the first arm comprising a handle attached thereto for carrying the first arm.

19. The mobile multimedia workstation of claim 1 further comprising a second clamp comprising first and second clamp faces connected by an adjustable connecting member for disposing within the opening defined between the first and second upright members, the adjustable connecting member adjustable to urge the first and second clamp faces in a direction toward each other into contact with front and rear surfaces of the first and second upright members, thereby holding a vertical position of the second clamp along the first and second upright members;

first and second bosses extending outwardly from the second clamp face;

a first end of a connecting member attached to the first and second bosses;

a second end of the connecting member attached to a plate;

the plate attached to a rear surface of a second device; and wherein the member allows tilting up/down and swiveling left/right of the second device.

20. The mobile multimedia workstation of claim 1 wherein the first device comprises a camera, a smart phone, a tablet computer, a light source, or an LED panel, and wherein the first device is adjustable relative to the arm.

21. The mobile multimedia workstation of claim 1 further comprising a second clamp comprising first and second clamp faces connected by an adjustable connecting member for disposing within the opening defined between the first and second upright members, the adjustable connecting member adjustable to urge the first and second clamp faces in a direction toward each other and in contact with the front and rear surfaces of the first and second upright members to hold a position of the second clamp along the first and second upright members;

a second arm extending outwardly from the first clamp face;

a platform attached to the second arm; and

wherein loosening the connecting member permits raising or lowering of the platform along the first and second upright members.

22. The mobile multimedia workstation of claim 1 further comprising one or more LED panels each rigidly or adjustably attached to one or both of the upright members via an intervening attachment member.

23. The mobile multimedia workstation of claim 22 the one or more LED panels for supplying adjustable lighting with regard to color, color temperature, intensity, and contrast.

24. The mobile multimedia workstation of claim 1 each of the first and second upright members comprising three vertical elements, an illumination source affixed to one or more of the three vertical elements of each of the first and second upright members.

25. The mobile multimedia workstation of claim 24 the illumination source affixed to any inside-facing surface or any outside-facing surface of the three vertical elements of the first upright member and to any inside-facing surface or any outside-facing surface of the three vertical elements of the second upright member.

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